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CONTENTS

Page

School Library Supervisory Programs in City School Systems:
Treas A. Maddox 1

A Study of Several Psychometric Tests as a Basis for Guidance on the Junior High School Level:
Elizabeth M. Stalnaker 41

A Study of the Extent of Association of Certain Professional and Personal Data with Judged Effectiveness of Teacher Behavior:
David G. Ryans 61

Determining Critical Requirements for Teachers:
Alfred C. Jensen 79

Photographic Analysis of Certain Letter Forms with Respect to Speed Changes and Stability:
Harold Bowers 87

Reactions of Negro Children Toward Negro and White Teachers:
Claudia Lewis and Barbara Biber 97

An Exploratory Investigation of the Effect of Certain Selected Factors Upon Performance of Sixth-Grade Children in Arithmetic:
John B. Beerbard 103

Correlation of Two Tests of Space Perception with Non-Language Intelligence:
David H. Fitz 113

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SCHOOL LIBRARY SUPERVISORY PROGRAMS IN CITY SCHOOL SYSTEMS*

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Introduction

The Committee on Post-War Planning of the American Library Association, with Mary Peacock Douglas as chairman, made this statement concerning supervisory programs for school library systems:

> The library of each individual school may be an independent unit, but a coordinated program of school library service with supervision and central organization for all the schools in any administrative unit constitutes a more efficient arrangement.[1]

Since many school administrators are becoming increasingly aware of the significance of a centralized supervisory program to coordinate activities and functions of the city's school library system, the trend has been toward developing this type of service in city school systems.

In some city school systems the school library department is administered by persons who have specific qualifications for supervision of libraries, who devote full time to library supervision, are specifically trained for the position, and are experienced in the work. In other systems, however, the school library department is administered by persons who do not have special qualifications for supervision of libraries. Supervision is in charge of subject specialists, administrative assistants, and others, who devote part time to other school departments or administrative activities. These persons have no education specifically for librarianship, or at best it consists of a few courses of an elementary nature. Often their experience is limited to that which they have received in the position they now hold.

Statement of the Problem. —The present study is a comparison of the professional qualifications of persons in charge of supervising city school libraries; of the character of the positions they hold; of the means they use to develop school library programs; of the results of their leadership; and of the standards in respect to amount and kind of services generally thought necessary to the development of a sound school library program.

Hypothesis. —The present study is based on the assumption that there is a significant relationship between the quality of school library supervision and the quality of library service in the school system. Furthermore, that the quality of the service is affected by the qualifications of those whose specific responsibility it is to develop the school library program.

Reason for the Study. —An interest in two types of library supervisors holding supervisory positions led to the examination of professional library literature for information pertaining to school library supervision in city school systems. It was found that there is little available information on this subject. Moreover, two well known authorities in the field of school library work have indicated a need for investigation in this area of library service. Fargo has suggested for study the functions and activities of depart-

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1. American Library Association. School Libraries for Today and Tomorrow, Function and Standards (Chicago: American Library Association, 1945), p. 30.

ments of school library supervision in cities.[2] Heaps suggested for study the services of trained and untrained librarians.[3]

Furthermore, the present study is an outgrowth of personal interest because of the policies and practices of the supervisory program in the city school system in which the investigator is employed. Here, as in many school systems, the libraries are supervised by a person who has many other supervisory or administrative responsibilities. The study may reveal that this type of supervisor lacks the training, experience and time necessary to develop the library program to its fullest potentialities.

Definition of Terms. —Certain terms need to be defined as used in making this report. Whenever they occur they are to be interpreted as follows: School library, a public school library maintained by a city school board; Type I school library supervisor, a professionally trained school library supervisor, one possessing specialized knowledge and experience, who aids school administrators in directing, correlating, and developing the activities and functions of the secondary school library department and whose sole responsibility is school library supervision in the school system; Type II school library supervisor, a person who has little or no professional library education for school library supervision, who is responsible for aiding school administrators in directing, correlating and developing the activities and functions of the secondary school library department, but who does not devote full time to library supervision in the school system.

The above defines in a technical sense Type I and Type II school library supervisors; however, in this study the two types of supervisors will also be referred to as qualified and not so qualified, specifically qualified and not specifically qualified, first and second class, first and second group, first and second kind and other related terms.

Scope. —In making this study the sampling was limited to school library systems in cities employing secondary school library supervisors, either Type I or Type II. The study was confined to situations in larger cities, since it is only in these school systems that school library supervisors are employed.

Background of the Problem. —For an understanding of this study, it is necessary to know the thinking that has been done on the problem of supervisory programs and the experience gained from such programs. One aspect of such a program is usually centralization of technical and other library services. The value of centralized services is summarized by Cecil and Heaps as follows:

> Economy and expert supervision are the two outstanding reasons for centralization. The centering in one department, in the hands of experts, of all matters pertaining to the selection, purchasing and cataloging of books for all school libraries, results in saving both time and money. Expert supervision insures even development, correlation of library services with other departmental and curricular activities, adequate standards, and proper personnel.
>
> The director of school libraries, as administrative head, determines the guiding principles and work of organization and general policies of the department. She meets with other school supervisors and heads of staff to take an active part in the discussion of problems relating to the correlation of school libraries with other departments.[4]

Wilson has this to say about establishing centralized programs:

> If no supervisor is to be employed, as in a small city, the most able school librarian may be chosen as chairman of the school library committee, and permitted to direct the cooperative plans. Both time and money are saved through:
>
> 1. The interloan of book collections between buildings;
> 2. The joint preparation of book orders;
> 3. The joint construction of bibliographies and school lists;
> 4. The grouping of technical supply requisitions;
> 5. The exchange of help at inventory;
> 6. The sharing of an assistant's time;

2. National Committee on Coordination in Secondary Education. Suggested Studies in Secondary Education: A List of Problems for Research (Washington, D.C.: Civic Education Service, 1939), pp. 79-94.

3. W. A. Heaps. "School-Library Studies and Research 1936-38," Library Quarterly, X (July 1940), pp. 385-392.

4. H. L. Cecil and W. A. Heaps. School Library Service in the United States (New York: H. W. Wilson Co., 1940), pp. 181-182.

7. A cooperative study of new resources needed.

The more closely the group works together, the more effective will be the library service given to the schools as a whole. [5]

The reasons advanced by Fargo for centralized organization and administration of school libraries are economy and expert supervision. Economy, she states, is achieved through book selection and purchase of books by experts. She further states expert supervision provides standards of service and of personnel; correlation of the library program with other departmental and curricular activities; and aid and advice for untrained library workers such as teachers and part-time librarians. [6]

In speaking of the need for school library supervisory programs the committee on Post-War Planning of the American Library Association has this to say:

> The proved efficiency of this plan makes it appear a desirable standard for school library administration. The duplication of work, inevitable where there are o centralized services, is an extravagance which can be ill-afforded by any school system. [7]

Relation of the Study to Previous Reports. — Above, reference has been made to three well-known books which are of general importance to school library service, Fargo's The Library in the School; Wilson's School Library Management; and Cecil and Heaps' School Library Service in the United States.

Other titles to which the present investigation is related which should be mentioned are: A Survey of Activities of City Supervisors of School Libraries by Klyver; and Certain Aspects of School Library Administration by the Educational Research Service of the American Association of School Administrators. The Klyver investigation, made about twenty years ago, pointed out that there appeared to be no definite activities of city school library supervisors, that duties corresponded in a general way to those of school librarians. [8] The "Certain Report" made inquiry into the status of school library supervisors. [9] The findings of both studies were used in the preparation of the questionnaire for the present investigation.

Methods and Procedures

To make this study it was necessary to survey the situation in city school systems employing city school library supervisors. The questionnaire was the instrument used to collect the data. However, a preliminary investigation was necessary to locate the city school systems employing secondary school library supervisors.

Preliminary Investigation. —In order to locate school systems with supervisory library programs which might be willing to participate in the study a double postal card (see Appendix II for sample postal card)[10] was sent to 111 school systems selected from reports and articles in professional library and educational literature; from a mimeographed list City, Town and County Supervisors, prepared by the School and Children's Library Office of American Library Association; and from Patterson's American Educational Dictionary. It seemed that some type of library supervisory program existed in each school system represented in the sample. The postal card explained briefly the scope of the study, asked whether a supervisor was employed and, if so, whether she would be willing to submit data concerning the library supervisory program and to request five secondary school librarians in the system to do likewise. Table I shows distribution of library supervisory programs in relation to population. Seventy-four, or 65 percent of the city school systems approached, returned cards, but only fifty-nine, or 79 percent of these, had supervisory programs. If size of city is accepted as an indication of the size of the school sys-

5. Martha Wilson. School Library Management, Sixth Ed. Rev., and rewritten by Althea M. Currin (New York: H. W. Wilson Co., 1930).

6. L. F. Fargo. The Library in the School (Chicago: American Library Association, 1939), p. 443.

7. American Library Association, op. cit., p. 34.

8. E. F. Klyver. A Survey of the Activities of City Supervisors of School Libraries. Master's Thesis, Columbia University, New York, 1930.

9. Certain Aspects of School Library Administration (Washington, D.C.: American Association of School Administrators, 1930), p. 15.

10. All references to Appendices will be found in original thesis, Columbia University, New York City.

TABLE I

DISTRIBUTION OF POSTAL CARDS SENT, TO LOCATE SUPERVISORY PROGRAMS, IN RELATION TO POPULATION

Population of City	No. cards sent	No. cards returned	Supervisory programs located	
			No.	%*
50,000 to 100,000	25	22	9	12
100,001 to 1,000,000	77	44	42	57
Over 1,000,000	9	8	8	11
Total	111	74	59	79

*Percent based on number of cards returned.

TABLE II

LIBRARY SUPERVISORY PROGRAMS IN CITY SCHOOL SYSTEMS

Library Supervisory Programs	City School Systems	
	Number	Percent
Supervisory of library activities		
Yes	59	80
No	10	14
No answer	5	6
Agency responsible for supervisory activities		
Board of Education	63	85
Public Library	0	0
Cooperative agreement	3	4
No answer	8	11

TABLE III

DISTRIBUTION OF QUESTIONNAIRES IN RELATION TO TYPE OF SUPERVISOR

Type of Supervisor	Questionnaires Sent			Questionnaires Returned				
	No. of school systems	No. of supervisors	No. of librarians	No. of school systems	No. of supervisors	Percent supervisors	No. of librarians	Percent librarians
Type I	23	23	115	18	15	65	51	44
Type II	18	18	90	16	12	67	47	52
Total	41	41	205	34	27	66	98	48

TABLE IV

DISTRIBUTION OF TYPE I AND TYPE II SUPERVISORS IN CITIES OF DIFFERENT SIZES

Population of City	Number of Supervisors	
	Type I	Type II
50,000 to 100,000	3	0
100,001 to 1,000,000	11	15
Over 1,000,000	4	1

TABLE V

DISTRIBUTION, BY UNIT OF ORGANIZATION, OF SECONDARY SCHOOLS EMPLOYING TYPE I AND TYPE II SUPERVISORS

Type of Supervisor	Secondary Schools			
	No. of Jr. High Schools	No. of Sr. High Schools	No. of Combination Jr.-Sr. High Schools	Total
Type I	428	126	20	574
Type II	66	84	33	183
Total	494	210	53	757

TABLE VI

ORGANIZATION AND PERSONNEL OF LIBRARY DEPARTMENTS UNDER TYPE I AND TYPE II SUPERVISORS

Organization and Personnel	Supervisors			
	Type I		Type II	
	No.	Percent	No.	Percent
Organization				
City school library department or division				
Yes	15	100	0	0
No	0	0	12	100
Department or division to which library supervisor is attached where there is no library department or division				
Assistant superintendent's office	0	0	2	17
Curriculum department	0	0	5	42
English department	0	0	3	25
High school library	0	0	1	8
Teachers professional library	0	0	1	8
Postion of the supervisor				
Full-time library supervisor	15	100	0	0
Part-time library supervisor:				
Ass't superintendent	0	0	2	17
Principal	0	0	0	0
High school librarian	0	0	1	8
Director of curriculum	0	0	5	42
Supervisor or director of English	0	0	5	25
Teachers' professional librarian	0	0	1	8

TABLE VI (Continued)

Organization and Personnel	Supervisors			
	Type I		Type II	
	No.	Percent	No.	Percent
Personnel				
Central office				
Supervisor	15	100	12	100
Assistant supervisor				
None	9	60	8	67
One	6	40	4	34
Professional librarians				
One	4	27	3	25
Five to ten	2	13	0	0
Teacher-librarians				
One	1	7	0	0
Two	1	7	0	0
Clerical assistants				
Full-time				
One	7	47	2	17
Two	5	33	0	0
Part-time				
One	4	27	2	17
Clerks and student assistants				
One	5	33	1	8
Two or three	4	27	0	0
City school libraries				
Professional librarians	425	71	127	84
Teacher-librarians	170	29	25	16
Clerical assistants				
Full-time sec'taries	43	7	41	26
Part-time sec'taries	5	.8	0	0
Paid student ass'ts	36	6	7	5

tem, data seem to suggest that library supervisory programs are more frequently found in large than in small school systems, since only 12 percent of such programs were located in cities having less than 100,000 population.

Table II shows responses made in answer to questions asked. Replies from the 74 respondents revealed that 59, or 80 percent of the city school systems represented, employed a person responsible for supervising or directing activities of the school libraries; ten, or 14 percent had no one in charge of library supervisory activities; while five, or 6 percent, did not answer the question. Also, 63, or 85 percent of the city school systems, reported that the Board of Education is the agency responsible for supervisory services to secondary school libraries in their school systems. None indicated that its supervisory program was administered by the public library, but three, or 4 percent, signified that secondary school library supervisory programs functioned through a cooperative agreement between the Board of Education and the Public Library. Eight, or 11 percent of those who returned cards, did not answer this question.

Collection of Data. —Two different questionnaires were constructed to collect data, one from secondary school library supervisors, the other from librarians in secondary schools in cities employing library supervisors. To avoid undue demands on the respondents' time, both questionnaires were constructed so that most of the questions could be answered by checking.[11] The questionnaire directed to the secondary school library supervisors sought information regarding the qualifications considered necessary for city school library supervisors, the character of the positions held, the means used to develop school library programs. The questionnaire to secondary school librarians attempted to discover which services are considered by secondary school librarians to be essential to the development of library programs in individual schools. A letter explaining the study which was being undertaken accompanied each questionnaire.[12]

One questionnaire for city school library supervisors and five questionnaires to secondary school librarians were sent to each of the city school library supervisors in forty-one cities, making a total of forty-one questionnaires sent to library supervisors, and 205 questionnaires sent for school librarians. Table III shows distribution of questionnaires in relation to type of supervisor.

One hundred twenty-five, or 50 percent of the questionnaires, were returned. The 125 respondents represented thirty-four school library programs in cities located in twenty-three states.

Table IV shows the population of cities in which different types of supervisors, who met the requirements of the study, are employed. Only 41 out of 50 supervisory programs located met requirements of the study. Of the 18 respondents not meeting requirements, 8 failed to indicate the agency responsible for library supervisory activities; 3 functioned through a cooperative agreement between the Board of Education and the Public Library; and 5 supervisory programs had too few secondary librarians in the school system.

Data in Table V reveal the distribution of secondary schools according to the two types of school library supervisors.

Treatment of Data. —Data collected were analyzed in relation to the problem, (1) to see what the library supervisory situation was, (2) to show differences and similarities of supervisory programs and of qualifications, training and experience, and function of Type I and Type II supervisors, and (3) to approve the amount and kind of services librarians receive and do not receive from supervisors, which are considered necessary to the development of a sound city school library program. An analysis and interpretation of the data collected are presented in the following sections.

Organization, Personnel and Services of School Library Departments

The findings of this study concerning the organization, personnel and services of school library systems under Type I and Type II supervisors reveal some noticeable variations under the two different types of leadership.

Organization and Personnel of School Library Systems. —Table VI shows that the fifteen supervisors specifically qualified for their duties report a school library department or division, while the twelve not so qualified report no such department or division in their school systems. The latter indicate that the library program is attached to another department or office of the school system.

It may be noted that in school systems having no library department or division the supervisory program is generally attached to the curriculum department, to the English department, or to the assistant superintendent's office. These facts support the above assumption that there are differences in organization of the offices of the two kinds of city school library supervisors.

The positions of the twenty-seven library supervisors in the selected city school systems are

11. See Appendix III, A and B for sample questionnaires in original thesis.

12. See Appendix II, B and C, for sample letters.

also shown in Table VI. The fifteen comprising Type I devote full-time to directing, correlating and developing activities of the school library department in the city school system, while the twelve belonging to Type II are engaged in other supervisory or administrative duties in addition to those connected with libraries. The second group also function as directors of curriculum departments, supervisors or directors of English departments, assistant superintendents, high school librarians or librarians of teachers' professional libraries.

Personnel of Central Library Office. —The findings seem to indicate that the personnel of central library offices vary under the two classes of school library supervisors. Sixty percent of Type I do not have an assistant library supervisor, as against 67 percent of Type II without such an assistant. Twenty-seven percent of the first class and 25 percent of the second report at least one professional assistant in the central office. However, 13 percent of the former report five to ten such assistants. None of the latter report a similar number. Type I supervisors also have one or more full-time clerical assistants. Fewer than 20 percent of Type II have clerical assistants. Table VI shows the number and kinds of assistants in the central office under the two types of supervisors.

Personnel of City School Libraries. —Reference to the data in Table VI, giving personnel in city school libraries reveals that the number and classes of employees are not identical under the two types of supervisory programs. Perhaps this is due in part to programs of individual school libraries, number of services performed by the central office, and needs of particular libraries. Under Type I supervisors, 71 percent of the librarians are professional librarians; under Type II, 84 percent are professional librarians. However, fewer teacher-librarians are employed for libraries in school systems having supervisors belonging to the second category than for those belonging to the first. The data of this investigation also reveal that school librarians having Type II supervisors are more frequently provided secretarial assistance than those with Type I. There is, in addition, evidence that better provision is made for personnel in city school libraries under the former than under the latter.

Services of supervisors to School Libraries.— As a further step in the analysis of the problem, an attempt was made to determine any differences or similarities in services performed for libraries under the two types of supervisors. Services considered were those connected with performance of technical processes, with central collections of books and other library materials, and with in-service library training programs.

Technical Processes. —Data indicate that the central office or staff performs more technical processes under supervisors specifically qualified than under those who have not had specific training for school library supervision. Moreover, under the former 53 percent of the central offices perform technical processes for both elementary and secondary school libraries; under the latter, none of the central offices performs these processes for two educational levels. This may be due to personnel in the central office, organization of the central office, training and experience of supervisors, amount of time supervisors devote to library supervisory activities, needs of libraries, and many other factors. Responses reported in Table VII reveal that 80 percent of the supervisors belonging to Type I indicated that ordering and purchasing are centralized; while only 50 percent of those belonging to Type II reported it is centralized in their school systems. Also, 80 percent of the first group, as against only 17 percent of the second reported classifying a centralized service in their school systems. It can further be noted that 73 percent of Type I and only 17 percent of Type II have centralized cataloging.

Central Collection of Books and Other Library Materials. —Both types of supervisors report the performance of many services pertaining to a central collection of books and other materials (Table VII). A central professional collection of books and magazines for administrators, teachers and librarians is maintained under 93 percent of Type I supervisors, while only 42 percent of Type II have such a collection. However, only 27 percent of the former provide a central collection of courses of study; whereas 50 percent of the latter make this material available. There is no supporting evidence that audio-visual materials are more often centralized under supervisors specifically qualified than under those not so qualified. However, there seems to be evidence that centralized services to provide sample textbook collections and exchange services for duplicate books and periodicals are a little more numerous under Type II than under Type I supervisors.

In-Service Library Training Program. — In-service library training programs are more often provided by Type I than by Type II supervisors in city schools. (See Table VII.) This probably is due, in part, to the fact that supervisors representing the first group may be more aware of the importance and need for personnel standards for both the professional librarian and the teacher-librarian than those representing the second. They are also better equipped to plan and carry out such a program. Forty percent of the supervisors specifically qualified for school library supervision indicate that in-service library training programs are a service for both teachers and librarians in their school systems,

TABLE VII

SERVICES PERFORMED BY CENTRAL OFFICE UNDER TYPE I AND TYPE II SUPERVISORS

Service	Supervisor			
	Type I		Type II	
	No.	Percent	No.	Percent
Technical processes				
Ordering and purchasing	12	80	6	50
Classifying	12	80	2	17
Cataloging	11	73	2	17
Accessioning	8	53	2	17
Shelf-listing	8	53	2	17
Inventorying	5	33	2	17
Mechanical preparation of books	8	53	2	17
Union catalog	8	53	1	8
Central collection of books and other library materials				
Model collection of books for a school library	4	27	3	25
Reserve collection of books, pamphlets and other materials to supplement school library collection	7	47	2	17
Professional collection of books, magazines, etc., for administrators, teachers and librarians	14	93	5	42
Exchange service for duplicate books, periodicals, etc.	4	27	5	42
Sample textbook collection	5	35	5	42
Collection of courses of study	4	27	6	50
Audio-visual materials				
Radios	6	40	4	34
Motion picture projectors	8	53	7	58
Phonographs	8	53	5	42
Photographs	8	53	4	34

TABLE VII (Continued)

Service	Supervisor			
	Type I		Type II	
	No.	Percent	No.	Percent
Opaque projectors	8	53	7	58
Film strip projectors	9	60	8	67
Picture collections (Flat)	9	60	5	42
Motion pictures	9	60	8	67
Slides	9	60	8	67
Film strips	9	60	8	67
Museum objects and specimens	7	47	3	25
Maps and charts	8	53	6	50
Stereoscopes and views	0	0	1	8
Recordings	1	7	0	0
Exhibits	1	7	0	0
In-service library training program				
For teachers only	4	27	3	25
For librarians only	5	33	2	17
For teachers and librarians	6	40	4	34
Through summer workshops or summer programs	5	33	2	17
Through winter training programs	6	40	1	8
Through departmental meetings	13	87	5	42
Through periodic communications and bulletins	11	73	5	42
Other	2	13	3	25

TABLE VIII

EDUCATIONAL QUALIFICATIONS OF TYPE I AND TYPE II SUPERVISORS

Educational Qualifications	Supervisor			
	Type I		Type II	
	No.	Percent	No.	Percent
Undergraduate academic				
College				
State school	7	47	1	8
Private school	8	53	4	34
No report	0	0	7	58
Degree				
Bachelor of Arts	7	47	4	34
Bachelor of Music	0	0	1	8
Bachelor of Science	6	40	1	8
Bachelor of Education	1	7	0	0
No report	1	7	6	50
Major field				
English	7	47	3	25
Mathematics	1	7	0	0
Science	2	13	0	0
Social Science	2	13	0	0
Music	0	0	1	8
English and education	1	7	0	0
English and Spanish	0	0	1	8
Education and library science	0	0	1	8
Education and science	1	7	0	0
Education courses	13	87	5	42
Graduate academic				
Type of school				
State school	2	13	1	8
Private school	5	33	3	25
Degree				
Master of Arts	2	13	4	34
Master of Education	1	7	0	0
Major field				
English	1	7	2	17
Education	1	7	2	17
Education and library science	1	7	0	0
Social science	2	13	0	0
English and French	1	7	0	0
Education courses	3	20	4	34

TABLE VIII (Continued)

Educational Qualifications	Supervisor			
	Type I		Type II	
	No.	Percent	No.	Percent
Undergraduate professional				
Type of school				
State school	5	33	2	17
Private school	10	67	1	8
No report	0	0	9	75
Degree				
Bachelor of Library Science	13	87	2	17
Major field				
School library	5	33	1	8
General course of study	4	27	1	8
Music library	0	0	1	8
Graduate professional				
Type of school				
State school	0	0	0	0
Private school	2	13	0	0
Degree				
Master of Library Science	0	0	0	0
Major field				
School library	1	7	0	0
General library science course	1	7	0	0

TABLE IX

TEACHING, LIBRARY, BUSINESS AND ADMINISTRATIVE EXPERIENCE OF TYPE I AND TYPE II SUPERVISORS

Experience	Supervisor			
	Type I		Type II	
	No.	Percent	No.	Percent
Non-administrative				
Teaching				
Public schools				
One to five years	7	47	3	25
Six to ten years	5	33	0	0
Eleven or more years	2	13	1	8
Grade or subject				
Elementary grades	5	33	0	0
Major academic subjects in high school	10	67	3	25
College or university				
Less than five years	3	20	1	8
Over five years	1	7	0	0
Subjects				
Children's literature	2	13	0	0
Physics	1	7	0	0
Library school				
Less than five years	0	0	1	8
Subjects				
Not reported	0	0	0	0
Other				
College summer courses	5	33	0	0
Summer workshops in library service	2	13	1	8
In-service training classes	1	7	0	0
Private school teaching	1	7	0	0
Private music classes	0	0	1	8
Library				
School library				
Less than five years	2	13	3	25
Six to ten years	7	47	0	0
Eleven or more years	4	27	1	8
Educational level				
Elementary	0	0	0	0
Secondary	11	73	3	25
Elementary and secondary	2	13	3	25

TABLE IX (Continued)

Experience	Supervisor			
	Type I		Type II	
	No.	Percent	No.	Percent
Public library				
Less than five years	4	27	1	8
Six or more years	1	7	0	0
Type of work				
Information desk and general work	2	13	1	8
Circulation and cataloging	1	7	0	0
Assistant children's librarian	1	7	0	0
County library	0	0	0	0
State library				
Less than five years	1	7	0	0
Type of work				
Book reviewing and cataloging	1	7	0	0
Other				
University and teachers' college library	1	7	2	17
Library of State Dept. of Education	0	0	1	8
Rental library	1	7	0	0
Board of Education library	1	7	0	0
Use of library as student and teacher	0	0	1	8
Business				
Less than five years	3	20	1	8
More than five years	0	0	1	8
Type of work				
Radio publicity	0	0	1	8
Book interest	0	0	1	8
American Library Association	1	7	0	0
Aviation storekeeper (U.S.N.R.)	1	7	0	0
Bureau of Aircraft production (head of files)	1	7	0	0

TABLE IX (Continued)

Experience	Supervisor			
	Type I		Type II	
	No.	Percent	No.	Percent
Supervisory or administrative				
School library supervisor				
Less that five years	4	27	2	17
Five or more years	9	60	2	17
School superintendent				
One year	0	0	1	8
School supervisor or director of department other than library				
Over ten years	0	0	1	8
Type of work				
Director of English	0	0	1	8
Principal	0	0	0	0
Assistant principal of secondary schools	0	0	1	8
Assistant supervisor of libraries	1	7	0	0
Director of rural school libraries	1	7	0	0
State supervisor of W. P. A. library projects	1	7	0	0

while only 34 percent of those not so qualified reported this service is provided both groups. Also, 87 percent of the former direct in-service library training programs through departmental meetings, whereas only 42 percent of the latter use this means to extend training. In addition, 73 percent of the former give in-service library training through periodic communications and bulletins, while only 42 percent of the latter prepare such materials for distribution.

Qualifications of City School Library Supervisors

Educational Qualifications. —A study of the training and experience of school library supervisors reveals that there is little similarity in the educational background of the two classes being considered. The data of this investigation suggest that Type I supervisors, more frequently than Type II, have the professional training in both library and educational fields and the broad educational background which is advocated by Fargo. 13

Academic Training. —Findings reveal that 94 percent of Type I supervisors have B. S., B. A., or B. E. degrees, and 50 percent of Type II have B. S., B. A., or B. Mus., degrees. However, 46 percent of the former, as against 33 percent of the latter have done some graduate study. Twenty percent of Type I and 34 percent of Type II have been granted master's degrees. There were no doctor's degrees reported (Table VIII).

An analysis of the academic fields of study of the two groups lends support to the statement that those qualified specifically for their duties have broader educational background than those not so qualified. In general, the major fields of undergraduate study, as reported by those specifically qualified, include English, science and social science; while the major field of undergraduate study reported by those not so qualified is English. It may be noted that 87 percent of the former have had some undergraduate courses in education, as against 42 percent of the latter.

Professional Training. —All of the supervisors belonging to Type I, but only 25 percent of those belonging to Type II, report having had professional library training (Table VIII). The Bachelor of Library Science degree was granted to more than 85 percent of the former, and to less than 20 percent of the latter. None of the supervisors has a master's degree in library science, but 13 percent of Type I report they have taken some graduate courses. No such courses were reported among those representing Type II.

The findings in Table VIII also show the major courses of professional library training of the supervisors. Thirty-three percent of the first class, as against only 8 percent of the second specialized in courses of study in the field of school library service.

Experience of Library Supervisors. —Concerning experience of supervisors, Type I have had varied experience in the fields of teaching, library and business, and Type II a wider variety of administrative and supervisory experience.

Teaching Experience. —Table IX gives experience of supervisors. Ninety-five percent of the specifically qualified have had teaching experience in elementary and secondary schools; only 35 percent of those who have not had specific training for school library supervision have had teaching experience, all on the secondary level. Twenty percent of Type I and 8 percent of Type II have taught in colleges or universities, all "less than five years". About 35 percent of the former also report having taught college classes during summer sessions. None of the latter have had such experience. Furthermore, only 13 percent of Type I and 8 percent of Type II supervisors have conducted summer workshops in library service.

Library Experience. —As to library experience, Type I supervisors have had more experience in school, public and state libraries than Type II (Table IX). Almost 90 percent of the first group have worked in either elementary or secondary school libraries. Only 50 percent of the second have had such experience. Moreover, 34 percent of Type I, but only 8 percent of Type II report having worked in public libraries, engaging in such activities as circulation, cataloging, children's work and general library service. None of the supervisors has had county library experience, but some representing Type I (less than 10 percent) report having worked in state libraries as catalogers and book reviewers.

Business Experience. —Business experience is thought to have value for those engaged in administrative work. However, only 20 percent of the supervisors belonging to Type I and 16 percent belonging to Type II have had experience in the business world. Reference to Table IX shows that the type of work done by respondents is almost as varied as the number of responses made.

Administrative or Supervisory Experience. —The findings on administrative and supervisory experience which the supervisors have had before being appointed to their present positions was of special interest to the investigator, since in any kind of executive work experience in meeting organizational and personnel problems is considered to be necessary to expert performance. Fewer Type II supervisors (50 percent) than Type I (90 percent) have held administrative or super-

13. Fargo, op. cit., p. 445.

visory positions. However, the former have had more varied experience. It may also be observed that executive experience of those belonging to Type I was related solely to library work. Those belonging to Type II had held positions not only in libraries, but also in schools as superintendents, supervisors of English departments, and principals of secondary schools.

Training and Experience Considered Most Essential to Supervisory Position. —It was one of the purposes of this investigation to attempt to discover the academic and professional training, and the kind of experience which supervisors consider most essential to the library supervisory position, as well as to learn if the two kinds of supervisors are in agreement in regard to these matters. The findings of this study seem to indicate that Fargo's thesis that supervisors need professional education and experience in both library and school work as well as a broad general background,[14] is more frequently supported by Type I than Type II supervisors.

Academic Training. —Supervisors' ratings of academic training considered essential to the supervisory position are given in Table X. Although there is no general agreement among supervisors as to essential academic training, there are certain noticeable trends which are apparent from the reports made by the two classes. Thirty-three percent of those classified as Type I and 42 percent of those classified as Type II rated liberal arts first in importance among the academic subjects and courses they considered most essential to the supervisory position. Twenty-seven percent of the former and 17 percent of the latter rated education courses second in importance.

Professional Training. —Table XI shows that there is considerable difference of opinion among supervisors as to professional training considered most essential to the position of school library supervisor. In the opinion of 40 percent of supervisors specifically qualified for their work and of 25 percent of those not so qualified, library administration courses are considered of first importance in professional training needed to equip a person for a supervisory position. However, 20 percent of the former and 8 percent of the latter rate such courses third. Twenty percent of Type I and 13 percent of Type II rate general library science courses second in importance.

Experience. —Regarding experience considered essential to the positions they hold there was little similarity of opinion among the two groups (Table XII). Sixty-seven percent of the supervisors belonging to the first group rank teaching experience of first importance to the library supervisory position. Only 8 percent of those belonging to the second give it this rank. Worth noting, however, is that more Type II than Type I supervisors consider school library experience of primary importance, 17 and 13 percent respectively. Twenty-seven percent of the latter rate both teaching and school library experience of secondary importance. Eight percent of Type II ranked teaching third. Further study of the table reveals that experience in public and community relationships, and in professional conferences are all rated third by those who thought they had any degree of importance.

Activities of Supervisors Pertaining to Development of Individual School Libraries

As a further step in the analysis of city school library supervisory programs, an attempt was made to ascertain the activities supervisors engage in, and to determine, if possible, the variations in number and kind of services performed by the two types of supervisors (Table XIII). For this study supervisory activities were classed according to services pertaining to the following: books and magazines; quarters and equipment; budget; instructional program; and general improvement. Certain activities, although important to the development of library programs, will not be considered here, since they were discussed above in relation to activities performed by the central office, for example, those connected with model book collections, and centralized technical services.

Activities Pertaining to Books and Magazines. —Table XIII reveals that services pertaining to books and magazines are more frequently performed by Type I than Type II supervisors. Eighty-seven percent of the former report that supervisory aid is given in developing book collections suitable to individual schools, as against 50 percent of the latter. Reference to the table also shows that of the former, 80 percent examine and evaluate books submitted by publishers; of the latter only 25 percent are so engaged.

Activities Pertaining to Library Quarters and Equipment. —The data collected show that the first group perform more advisory services pertaining to library quarters and equipment than the second. Ninety-three percent of the former, but only 34 percent of the latter give advisory services pertaining to plans for remodeling old or building new school libraries.

Services Pertaining to Budget. —As to supervisory services pertaining to the school library budget, Type I supervisors have more budgetary responsibilities than Type II. Budgets are prepared as the basis for appropriations by 93 per-

14. Fargo, op. cit., p. 445.

TABLE X

SUPERVISORS' RATINGS OF ACADEMIC SUBJECTS AND COURSES CONSIDERED ESSENTIAL TO SUPERVISORY POSITION

Subjects and Ratings	Supervisor			
	Type I		Type II	
	No.	Percent	No.	Percent
First in importance				
Liberal arts	5	33	5	42
Language and literature	5	33	1	8
Social sciences	1	7	0	0
Psychology courses	1	7	0	0
Education courses	3	20	0	0
Second in importance				
Liberal arts	2	13	0	0
Language and literature	2	13	0	0
Social sciences	2	13	2	17
Sciences	1	7	0	0
Science and mathematics	1	7	0	0
Psychology courses	1	7	1	8
Education courses	4	27	2	17
Third in importance				
Liberal arts	0	0	1	8
Language and literature	2	13	1	8
Social science	1	7	0	0
Science	1	7	1	8
Science and mathematics	1	7	0	0
Modern languages	1	7	0	0
Education courses	2	13	0	0

TABLE XI

SUPERVISORS' RATINGS OF PROFESSIONAL TRAINING CONSIDERED ESSENTIAL TO SUPERVISORY POSITION

Professional training and ratings	Supervisor			
	Type I		Type II	
	No.	Percent	No.	Percent
First in importance				
Library administration courses	6	40	3	25
Professional education courses	3	20	2	17
Library science training	5	33	0	0
Book selection and buying	1	7	0	0
Second in importance				
Library administration courses	3	20	0	0
Professional education courses	1	7	0	0
Library science training	3	20	2	13
Book selection and buying	3	20	0	0
Workshops in in-service training	1	7	1	8
Reading guidance for children	1	7	1	8
Library publicity	1	7	0	0
Business training	1	7	0	0
Graduate library courses	0	0	1	8
Third in importance				
Library administration courses	3	20	1	8
Library science training	0	0	1	8
Book selection and buying	3	20	0	0
Reference and buying	1	7	0	0
Cataloging	3	20	0	0
Use of community resources	1	7	0	0
Specialization in music	0	0	1	8

TABLE XII

SUPERVISORS' RATINGS OF EXPERIENCE CONSIDERED ESSENTIAL TO SUPERVISORY POSITION

Experience and rating	Supervisor			
	Type I		Type II	
	No.	Percent	No.	Percent
First in importance				
Library experience other than school	1	7	0	0
School library experience	2	13	2	17
Teaching experience	10	67	1	8
Memberships in professional organizations	1	7	0	0
Book interests	1	7	0	0
Work with people	0	0	1	8
Class use of library facilities	0	0	1	8
Second in importance				
Library experience other than school	1	7	1	8
School library experience	4	27	0	0
Teaching experience	4	27	0	0
Community and office work	2	13	0	0
Book interests	1	7	0	0
Public speaking	1	7	0	0
Summer school attendance	0	0	1	8
School administrative duties	1	7	2	17
Third in importance				
Library experience other than school	2	13	0	0
Public and community relationships	2	13	0	0
Professional conferences and conventions	2	13	0	0
School administrative duties	1	7	0	0
Youth activities	1	7	0	0
Professional reading	0	0	1	8
In-service Training	0	0	1	8
Teaching experience	0	0	1	8
Creative experience	0	0	1	8
Visits to other school systems	0	0	1	8

TABLE XIII

ACTIVITIES OF TYPE I AND TYPE II SUPERVISORS

Activities	Supervisor			
	Type I		Type II	
	No.	Percent	No.	Percent
Activities pertaining to books and magazines				
Examination and evaluation of books submitted by publishers	12	80	3	25
Preparation of lists of recommended books for purchase	10	69	4	34
Aid in planning book collections for new libraries	12	80	5	42
Aid in developing book collections suitable to individual schools	13	87	6	50
Preparation of special bibliographies or lists of books	13	87	3	25
Preparation of lists of recommended magazines for school libraries	11	73	6	50
Suggestions of exhibits and displays for use by individual libraries	12	80	6	50
Distribution of advertising materials and other pertinent information	0	0	1	8
Advisory services pertaining to library quarters and equipment				
Plans for remodeling old or building new libraries	14	93	4	34
Recommendations for decoration, furniture and equipment	13	87	5	42
Disposition of books, furniture and other equipment from abandoned school libraries	0	0	1	8
Services pertaining to budget				
Preparation of budget as basis of appropriation	14	93	2	17
Allocation of funds to individual school libraries	14	93	4	34
Services pertaining to instructional program				
Aid in preparation of courses of instruction for student library assistants	8	50	5	42
Aid in preparation of courses of instruction in the use of the library for pupils.	13	87	6	50

TABLE XIII (Continued)

Activities	Supervisor			
	Type I		Type II	
	No.	Percent	No.	Percent
Courses of instruction in the use of the library for teachers	6	40	4	34
Help in developing remedial reading programs	10	67	5	42
Work on curriculum committees to assist with selection of materials, such as books, audio-visual aids, pamphlets, etc.	14	93	5	42
Attendance at meetings of departmental supervisors or directors	15	100	6	50
Aid in coordinating work in all school libraries	0	0	1	8
Attendance at state and national meetings	1	7	0	0
Special committee work with supervisors, principals and other professionals	1	7	0	0
Activities for the purpose of general improvement				
Publicity activities				
Special exhibits and displays for use in individual libraries	7	47	4	34
Exchange service for circulation of exhibits and displays prepared by individual libraries	7	47	3	25
Library publicity for newspapers	12	80	5	42
Radio talks	9	60	4	34
Talks to civic organizations about school library needs and services	11	73	4	34
Meetings with teachers on library services	11	73	6	50
Book reviewing for civic groups	1	7	0	0
Writing professional articles and reports	1	7	0	0
Arranging for authors, editors, state library supervisors, etc., to address teachers and librarians	0	0	1	8
Activities pertaining to library personnel				
Help in developing training and certification standards for librarians	12	80	5	42
Assisting with selection of librarians for appointment	14	93	4	34

TABLE XIII(Continued)

Activities	Supervisor			
	Type I		Type II	
	No.	Percent	No.	Percent
Assisting with placement of school librarians	12	80	5	42
Aid in organizing student assistant groups	6	40	5	42
Arranging for substitute assistants	0	0	1	8
Approving in-service training courses	1	7	0	0
Consulting about library visitation	1	7	0	0
Evaluation of libraries				
Number of libraries evaluated by Cooperative Study of Secondary School Standards				
1 to 5	5	33	2	17
6 to 10	2	13	1	8
11 to 15	0	0	1	8
Number of libraries evaluated by local staff				
1 to 5	2	13	0	0
6 to 10	2	13	1	8
11 to 15	0	0	1	8

cent of the former, as against 17 percent of the latter. Allocation of funds to individual school libraries is made by 93 percent of Type I supervisors; by only 34 percent of Type II.

Services Pertaining to the Instructional Program. —The findings in Table XIII, giving services related to the instructional program, indicate that a wide variety of activities are performed by both classes of supervisors, but that Type I are the more active in extending such services. Study of the table reveals that all of the supervisors belonging to the first class, but only 50 percent belonging to the second class are in attendance at meetings of departmental supervisors or directors. Furthermore, 93 percent of the former work on curriculum committees to assist with selection of such materials as books, audio-visual aids and pamphlets; only 42 per cent of the latter do this.

Activities for the Purpose of General Improvement. —To learn what activities were engaged in for the purpose of general improvement of school libraries, data were collected on publicity, personnel work and evaluation of school libraries. The findings reveal that Type I supervisors more often than Type II were occupied with the following kinds of work: library publicity for newspapers; meetings with teachers to publicize library materials and services; and selection of librarians for individual school libraries.

Few city school library supervisors report activities in the evaluation of libraries in their school systems, either in preparation for evaluation by the Cooperative Study of Secondary School Standards or by help given the local staff in self evaluation. Table XIII gives the responses of the supervisors pertaining to the number of secondary school libraries which have been evaluated by either method. No more than 33 percent of Type I indicate that their city school libraries have been evaluated. However, fewer than 20 percent of Type II report evaluation of the libraries under their supervision.

Memberships in Professional Organizations.— As to memberships held in professional organizations by supervisors, the findings of this study show that Type I more frequently than Type II act in accordance with Fargo's point of view, that persons in school library work are members of two professions and need to ally themselves with both educational and library groups by holding memberships in both types of professional organizations[15] (Table XIV). A significantly larger percentage of Type I than Type II hold memberships in the following organizations: American Library Association; state library associations; the National Education Association; state educational associations; city teachers associations. About 25 percent of both kinds of supervisors are members of a city library association.

Library Visits. —Data pertaining to school library visits are given in Table XV. Visits to school libraries occur more frequently under supervisors specifically qualified for their work than under those not so qualified. About 50 percent of the former use this means of stimulating the work of librarians, as against approximately 35 percent of the latter.

Accomplishments of City School Library Supervisors

To further analyze the supervisory programs, data were collected on the accomplishments of both classes of supervisors in developing library programs during the ten-year period of 1938 to 1948 (Table XVI). Items selected to measure accomplishments were as follows: expenditures for school libraries; establishment of new libraries; training and certification standards for librarians; library research projects; and establishment of new services.

Findings indicate that there was a general increase in funds apportioned to school libraries from 1938 to 1948. Eighty-seven percent of those specifically qualified for their work reported budget increases of more than one hundred percent. Forty-two percent not so qualified report similar increase in funds during this period.

As to establishment of new libraries, Type I have been more successful than Type II supervisors during the period from 1938 to 1948. New elementary school libraries have been established more frequently than secondary by the two kinds of supervisors, perhaps because fewer elementary libraries were established before 1938. Secondary school libraries are usually developed first in a school system. Data further indicate that supervisors belonging to the first group have achieved more than those belonging to the second in improving librarians' status in regard to training and certification standards from 1938 to 1948. All of the former reported that during the period studied, training and certification standards were raised. Only about 15 percent of the latter reported such improvement. As to research projects, neither of the classifications being considered seemed to have accomplished much between 1938 and 1948. However, some effort was made by both classes of supervisors to investigate their city school library programs and to make recommendations for changes to school administrators.

The period 1938 to 1948 saw a number of new library services established by supervisors representing both Type I and Type II supervisors.

15. Fargo, op. cit., p. 516.

Forty percent of the former and 25 percent of the latter reported establishing centralized collections for audio-visual aids. Also, during this period centralized cataloging service was established by 27 percent of those of the first group, but none of the second. Moreover, those specifically qualified included the following among their accomplishments: establishing general library supervision; radio programs; training programs for new librarians; or organizing, throughout the entire school system, library collections already in existence.

Supervisory Services and Activities Considered Essential by Secondary School Librarians

It was one of the purposes of this investigation to attempt to discover, if possible, library services not given by school library supervisors, but which are considered by librarians to be essential to the development of library programs in individual schools. Library services investigated in this regard include those which are performed in central offices, as well as those activities engaged in by supervisors for the purpose of directing, correlating and promoting individual libraries in city school systems. It seemed possible that Type II supervisors, who spend less time on library supervisory activities and who have less professional training, would provide fewer services which librarians consider essential than Type I. This hypothesis was conclusively supported by evidence collected from the ninety-three respondents returning questionnaires.

Services of Central Office. —The findings related to services of the central office indicate that such services frequently are considered necessary by librarians not already provided them.

Technical Services. —Concerning centralized technical services, a significantly large percentage of librarians having both Type I and Type II supervisors report classifying, cataloging accessioning, shelf-listing, inventorying and mechanical preparation of books are technical processes not performed centrally in their school systems (Table XVII). Centralization of two services, classifying and cataloging, are services most frequently considered essential to the development of individual library programs by librarians to whom such are not already extended. Worth noting is that very few of the librarians in city school systems having supervisors specifically qualified do not have centralization of ordering and purchasing; while almost half of those having supervisors not so qualified do not receive this service. None of the librarians of those not receiving the service, and having Type I supervisor, desires centralization of ordering and purchasing, but a significant number having Type II wish centralization of the service. Most librarians would appear to prefer to perform such technical processes as inventorying and accessioning themselves, since few who do not already have these services indicate they would be helpful if provided.

Central Collections, Exchange and Information Services. —Table XVIII reveals the opinions of librarians regarding services related to central collections, exchange and information services. It was thought that librarians receiving few such services would desire supervisory assistance in these areas. However, data reveal that the majority of librarians under both groups of supervisors do not wish additional supervisory help pertaining to these services, although a considerable number indicate that they would welcome more assistance than now exists. Under Type I, 16 percent of the librarians do not have access to a central collection of audio-visual materials; under Type II, 37 percent of the librarians are not provided this service. Many librarians, 38 percent under the former and 24 percent under the latter, whose supervisory program does not provide a central collection of audio-visual materials and equipment, consider it a necessary supervisory service. As to central professional collections for the use of administrators, teachers and librarians, only 8 percent of the librarians having supervisors representing Type I as against 34 percent representing Type II indicate that their supervisory programs do not maintain such a collection. Where no central professional collection is maintained, none of the librarians having supervisors belonging to the first group, but 31 percent having those belonging to the second express the need for a professional collection of books, magazines and other materials, for administrators, teachers and librarians.

Services Related to In-Service Library Education. —As far as this investigator was able to determine, it appears that, with one exception, fewer than 25 percent of the librarians under the two classes of supervisors being considered would welcome more in-service library education than the supervisory program provides (Table XIX). Reference to the table reveals that 4 percent of the librarians under supervisors classified as Type I and 49 percent under those classified as Type II report departmental meetings are not held as part of in-service education for trained and untrained librarians. Of those whose supervisors do not conduct in-service library education for librarians through departmental meetings, 100 percent having the former, as against only 17 percent having the latter would welcome such in-service training.

Activities Pertaining to Selection and Use of Books and Magazines in Libraries. —Data in Table XX show activities pertaining to selection and use of books and magazines which supervisory programs do not provide but which librarians under the two types of supervisors consider es-

TABLE XIV

MEMBERSHIPS HELD BY TYPE I AND TYPE II SUPERVISORS IN PROFESSIONAL ORGANIZATIONS

Organizations	Supervisors Holding Memberships			
	Type I		Type II	
	No.	Percent	No.	Percent
Library				
American Library Association	14	93	5	42
Regional Library Association	11	73	4	34
State Library Association	15	100	4	34
City Library Association	4	27	3	25
Library Section of State Education Association	2	13	0	0
County School Library Association	1	7	0	0
Special Libraries Association	0	0	1	8
Educational				
National Education Association	12	80	5	42
State Education Association	14	93	7	58
City teachers' association	6	40	0	0
Assn. for Supervision and Curriculum Development	3	20	0	0
Assn. for Childhood Education	2	13	0	0
Natl. Council for Teachers of English	0	0	2	17
Other				
American Assn. of University Women	2	13	1	8
Delta Kappa Gamma	2	13	1	8
Kappa Delta Pi	0	0	1	8
School Administrators Club	1	7	0	0

TABLE XV

ACTIVITIES PERTAINING TO LIBRARY VISITS MADE BY SUPERVISORS

Activity	Supervisor			
	Type I		Type II	
	No.	Percent	No.	Percent
Number of visits				
Once a month	2	4	3	6
Once a quarter	7	14	4	9
Once a semester	8	16	4	9
Once a year	4	8	3	6
Once every two or three years	0	0	2	4
As needed	14	28	2	4
Frequently	4	8	3	6
Infrequently	7	14	9	19
No schedule	1	2	2	4
Purpose of supervisors' visits				
Supervision of technical processes	9	18	6	13
Observation of work of librarians	27	53	17	36
Stimulation of work of librarians	24	47	16	34
Discussion and advice on specific library problems	15	30	6	13
Coordination with other libraries	2	4	1	2
Special requests	0	0	1	2

TABLE XVI

ACCOMPLISHMENTS OF TYPE I AND TYPE II SUPERVISORS FROM 1938 TO 1948

Accomplishment	Supervisor			
	Type I		Type II	
	No.	Percent	No.	Percent
Expenditure for school libraries				
Budget doubled or more	13	87	5	42
Systematic budgeting for department and school libraries	1	7	0	0
New libraries established				
Elementary				
One to twenty-five	8	53	2	17
Twenty-six to fifty	1	7	0	0
Fifty to seventy-five	1	7	1	8
Secondary				
One to ten	8	53	1	8
Eleven to twenty-five	0	0	1	8
Training and certification standards for librarians				
Library degree recognized on some basis as master's degree	1	7	0	0
Library science degree required for secondary school librarians	5	33	0	0
Library science degree and teacher's certificate required for librarians	1	7	0	0
Twenty or more hours of library science required for teacher-librarians	2	13	1	8
Standards raised for both elementary and secondary school librarians	6	47	1	8
Library research projects				
Community library relationships investigated	0	0	1	8
Courses of study in library usage prepared	0	0	1	8
City school library program investigated and recommendations for changes made to school administrators	2	13	1	8
Bibliography compilation pertaining to state information	1	7	0	0

TABLE XVI (Continued)

Accomplishment	Supervisor			
	Type I		Type II	
	No.	Percent	No.	Percent
New library services				
Centralized cataloging	4	27	0	0
Centralized collection of audio-visual materials	6	40	3	25
Central information service	1	7	1	8
Central depository for library supplies	1	7	0	0
Centralization of all teaching aids	0	0	1	8
Centralized mending	1	7	0	0
Professional library for teachers, administrators, librarians and parents	2	13	3	25
Sample book display for examination by teachers, librarians, administrators, etc.	1	7	2	17
Magazine file	0	0	1	8
Telephone service for supplemental materials	1	7	0	0
Book exchange service	1	7	0	0
Truck delivery service	1	7	0	0
Co-sponsor of radio program	1	7	0	0
Libraries organized throughout school system	2	13	1	8
Promotion of use of audio-visual materials in library	1	7	0	0
General library supervision	1	7	0	0
Library lessons for elementary students	1	7	0	0
Library representatives selected by each school	1	7	0	0
Training program for new librarians	1	7	0	0

TABLE XVII

CENTRAL TECHNICAL SERVICES CONSIDERED ESSENTIAL BY LIBRARIANS UNDER TYPE I AND TYPE II SUPERVISORS

Technical Service	Supervisor							
	Type I				Type II			
	Librarians not given service		Librarians needing service		Librarians not given service		Librarians needing service	
	No.	%	No.	%	No.	%	No.	%
Ordering and purchasing	10	20	0	0	23	49	8	35
Classifying	36	70	11	31	43	91	16	37
Cataloging	36	70	17	47	43	91	17	40
Accessioning	37	73	6	17	43	91	12	28
Shelf-listing	35	69	10	29	43	91	13	30
Inventorying	46	90	3	7	43	91	5	12
Mechanical preparation of books	36	70	6	17	42	89	13	31
Union catalog	25	49	2	8	43	91	9	21

TABLE XVIII

CENTRAL COLLECTIONS, EXCHANGE AND INFORMATION SERVICES CONSIDERED ESSENTIAL BY LIBRARIANS UNDER TYPE I AND TYPE II SUPERVISORS

Central Collections, Exchange and Information Services	Supervisor							
	Type I				Type II			
	Librarians not given service		Librarians needing service		Librarians not given service		Librarians needing service	
	No.	%	No.	%	No.	%	No.	%
Model collection of books for a school library	40	78	6	15	19	40	8	42
Reserve collection of books, pamphlets and other materials to supplement school library collections	28	55	7	26	35	47	9	25
Professional collection of books, pamphlets, etc., maintained for administrators, teachers and librarians	4	8	0	0	16	34	5	31
Sample textbook collection	23	45	2	9	22	47	0	0
Collection of courses of study	16	31	3	20	18	38	0	0
Central library of audio-visual materials and equipment for circulation	8	16	3	38	17	37	4	24
Exchange service for duplicate books, periodicals, etc.	31	61	6	20	39	83	11	28
Central reference and information service	23	47	5	21	34	72	3	9

sential for developing individual school library programs. Fifty-one percent of librarians having specifically qualified supervisors, compared to 68 percent having not so qualified reported that the supervisory program does not engage in activities relating to examination and evaluation of books submitted by publishers. In cases where the above is not engaged in by the two kinds of supervisors there is little difference of opinion among librarians concerning the need for such activities. Thirty-five percent having the former, as against 34 percent having the latter express the need for this service. Further reference to the table reveals that 51 percent of librarians whose supervisors are classified as Type I and 81 percent whose supervisors are classified as Type II do not receive help from the supervisor with the preparation of special bibliographies or lists of books. Thirty-five percent of the former and 34 percent of the latter class desire this supervisory activity. It is also noted that under the two types of supervisors, 12 percent of the librarians having Type I, as against 74 percent having Type II supervisors, do not receive aid from their supervisor in planning book collections suitable for new libraries. A considerable number of librarians, 33 percent under the first and 31 percent under the second group of supervisors, are desirous of more such supervisory assistance than is now available.

Advisory Services Pertaining to Library Quarters and Equipment. —Table XXI gives responses of the ninety-three librarians on services related to library quarters and equipment, and on the desirability of such services when not available. Data reveal that only 18 percent of the librarians having supervisors classified as Type I are not assisted with plans for remodeling old or building new school libraries; whereas, as many as 68 percent having those classified as Type II are not given this advisory service. However, few of the above, 22 percent having the first and 28 percent having the second class of supervisors, consider this type of assistance needed for school library development. Further reference to the table shows that under the former 16 percent of the librarians receive no recommendations from the supervisor for decoration, furniture and equipment; under the latter, 66 percent of the librarians do not have this type of supervisory assistance. Only 25 percent of the librarians whose supervisors are specifically qualified for their duties and 26 percent of those not so qualified wish more assistance of this nature than is now available. There appears to be no supporting evidence that librarians desire more advisory help pertaining to quarters and equipment under Type II than under Type I supervisors.

Activities Pertaining to Instructional Program. —As to the satisfaction of needs of librarians in developing the instructional program, the two classifications of supervisory programs seem to supply fairly adequately most of the needs which librarians consider essential for developing individual school library programs (Table XXII). Seventy-five percent of the librarians under supervisors of the first class and 91 percent under the second are not aided by supervisors in giving courses of instruction in the use of the library for teachers; but only 29 percent of the former and 28 percent of the latter report need of such aid. In preparing courses of instruction in the use of the library for pupils, only 33 percent having supervisors belonging to Type I compared to 81 percent having those belonging to Type II are not assisted by the supervisor in this phase of library work. However, only 29 percent of the librarians under the former and 21 percent under the latter desire additional help with the student instructional program. It may also be noted that 51 percent of the librarians whose supervisors belong to the first group, as against 70 percent whose supervisors belong to the second group do not have assistance through a supervisory instructional program to help individual teachers and librarians develop remedial reading programs. Only 19 percent of the librarians under the former and 18 percent under the latter consider such assistance necessary, if it is not already provided by the supervisor.

Activities for the Purpose of General Improvement. —As far as this investigator has been able to determine, few librarians under either type of supervisor would welcome an increase in supervisory activities for the purpose of general improvement (Table XXIII). Neither kind of supervisory program seems to make much provision for the exchange of exhibits and displays prepared by individual libraries. Seventy-six percent of the librarians having Type I and 93 percent having Type II supervisors are not provided means for an exchange service of this nature. A significant number of both groups, 30 percent of the first and 32 percent of the second, indicate that the individual school library program would benefit from such services. Further reference to the table reveals librarians' responses on activities pertaining to personnel. A considerable number of librarians, 75 percent under supervisors specifically qualified and 91 percent under those not so qualified, are not given supervisory aid in organizing student assistant groups. Only 13 percent of those whose supervisors are of the first class desire assistance in organizing student assistant groups; whereas as many as 48 percent of those whose supervisors are of the second indicate individual school libraries would be improved through a program such as this. Study of the table also shows that 63 percent of the librarians under supervisors belonging to Type I and 81 percent under supervisors belonging to Type II are not given conferences

TABLE XIX

IN-SERVICE LIBRARY EDUCATION CONSIDERED ESSENTIAL BY LIBRARIANS UNDER TYPE I AND TYPE II SUPERVISORS

In-service library education	Supervisor							
	Type I				Type II			
	Librarians not given service		Librarians needing service		Librarians not given service		Librarians needing service	
	No.	%	No.	%	No.	%	No.	%
In-service training								
Summer workshops or training programs	27	53	5	19	42	89	9	21
Winter training programs	23	45	5	22	42	89	7	17
Departmental meetings	2	4	2	100	23	49	4	17
Communications and bulletins	13	25	1	7	27	57	6	22

TABLE XX

ACTIVITIES PERTAINING TO SELECTION AND USE OF BOOKS AND MAGAZINES IN LIBRARIES CONSIDERED ESSENTIAL BY LIBRARIANS UNDER TYPE I AND TYPE II SUPERVISORS

Activity	Supervisor							
	Type I				Type II			
	Librarians not given service		Librarians needing service		Librarians not given service		Librarians needing service	
	No.	%	No.	%	No.	%	No.	%
Examination and evaluation of books submitted by publishers	26	51	9	35	32	68	11	34
Preparation of lists of recommended books for school library purchase	31	61	7	26	38	81	13	34
Help in planning book collections for new libraries	6	12	2	33	35	74	11	31
Help in developing book collections suitable to individual schools	16	31	3	13	36	77	11	31
Preparation of special bibliographies or lists of books	26	51	9	35	38	81	13	34
Preparation of lists of recommended magazines for school libraries	23	45	3	13	39	83	12	31
Suggestions for exhibits and displays for use by individual libraries	25	49	5	20	42	89	9	21

TABLE XXI

SERVICES PERTAINING TO QUARTERS AND EQUIPMENT CONSIDERED ESSENTIAL BY LIBRARIANS UNDER TYPE I AND TYPE II SUPERVISORS

Quarters and equipment	Supervisor							
	Type I				Type II			
	Librarians not given service		Librarians needing service		Librarians not given service		Librarians needing service	
	No.	%	No.	%	No.	%	No.	%
Plans for remodeling old or building new school libraries	9	18	2	22	32	68	9	28
Recommendations for decoration furniture and equipment	8	16	2	25	31	66	8	26

TABLE XXII

INSTRUCTIONAL PROGRAM CONSIDERED ESSENTIAL BY LIBRARIANS UNDER TYPE I AND TYPE II SUPERVISORS

Instructional Program	Supervisor							
	Type I				Type II			
	Librarians not given activity		Librarians needing activity		Librarians not given activity		Librarians needing activity	
	No.	%	No.	%	No.	%	No.	%
Aids in preparing courses of instruction for student library assistants	32	63	7	22	42	89	6	14
Aids in preparing courses of instruction in the use of the library for pupils	17	33	5	29	38	81	8	21
Aids in giving courses of instruction in the use of the library for teachers	38	75	11	29	43	91	12	28
Helps individual teachers and librarians develop remedial reading programs	26	51	5	19	33	70	6	18
Works on curriculum committee to assist with selection of materials such as books, pamphlets, audio-visual aids, etc.	9	18	2	22	24	51	4	17

TABLE XXIII

ACTIVITIES FOR GENERAL IMPROVEMENT CONSIDERED ESSENTIAL BY LIBRARIANS UNDER TYPE I AND TYPE II SUPERVISORS

General Improvement	Supervisor							
	Type I				Type II			
	Librarians not given activity		Librarians needing activity		Librarians not given activity		Librarians needing activity	
	No.	%	No.	%	No.	%	No.	%
Publicity								
Preparation of special exhibits and displays for use by individual libraries	38	75	11	29	42	89	9	21
Exchange service for exhibits and displays prepared by individual libraries	39	76	12	30	44	93	14	32
Radio talks	31	76	3	9	40	85	5	13
Personnel								
Rates school librarians	24	47	4	17	32	68	3	9
Confers with librarians on their ratings	32	63	5	16	38	81	5	13
Aids in organizing student assistant groups	38	75	5	13	43	91	20	48

TABLE XXIV

ADEQUACY OF SUPERVISORY VISITS AS JUDGED BY LIBRARIANS UNDER TYPE I AND TYPE II SUPERVISORS

Type of Supervisor	Need for more supervisory visits			
	Yes	%	No	%
Type I	21	41	19	37
Type II	17	36	11	23

on their ratings by the supervisor. Few librarians, 16 percent under the former and 13 percent under the latter, who as yet do not confer with the supervisor on their ratings, consider personnel service of this nature essential to the development of individual library programs.

Activities Pertaining to Supervisory Visits. — Apparently school library supervisors do not make visits to libraries as frequently as many librarians under both classes of supervisory programs think desirable (Table XXIV). As many as 41 percent of the librarians under Type I supervisors and 36 percent under Type II are of the opinion that they would benefit from more frequent visits of their library supervisor.

Summary and Conclusions

This study is a comparison of two types of school library supervisory programs in city school systems, those administered by supervisors specifically qualified for library supervision, and those administered by supervisors not so qualified. The former supervisors were referred to in this study as Type I, the latter as Type II. The data for the study were obtained from questionnaire blanks submitted to school library supervisors and secondary school librarians in city school systems employing secondary school library supervisors.

The features of the supervisory programs deserving comparison divided themselves into five groups: professional qualifications of school library supervisors; character of their positions; means employed to develop school library programs; results of school library supervisory programs; and the amount and kind of services librarians do not receive but consider essential to the development of a sound city school library program.

The major findings pertaining to school library supervisory programs lend support to the hypothesis of this study. School systems employing Type I library supervisors maintain school library departments or divisions; whereas school systems employing Type II supervisors frequently maintain the library supervisory program as part of the curriculum department. There is a tendency for those of the latter classification to be also directors of curriculum departments in city school systems. Apparently, the central office is more adequately staffed by assistant supervisors, professional librarians, secretaries, and others, in school systems having supervisors classified as Type I than those classified as Type II.

In proportion to the number of schools in the school systems surveyed, fewer professional librarians and clerical workers are employed in school library systems having Type I than Type II supervisors. There is also evidence that teacher-librarians are more likely to be employed in school systems having supervisors from the former group than in those with supervisors from the latter.

There are definitely more technical processes performed by the staff of the central office under those specifically qualified for their work than under those not so qualified. The central office generally performs technical processes for both elementary and secondary school libraries in school systems having a school library department or division. There is also evidence that the central library offices are a little better developed under the first than under the second group of supervisors in that the former more frequently provide various types of in-service library training programs for both teachers and librarians.

Type I supervisors have broader academic training and more extensive professional library training on the undergraduate level than Type II supervisors. On the graduate level the first group have less academic training, but more professional training than the second.

Supervisors belonging to Type II do not seem to have had as varied experience in the fields of teaching, library work and business as those belonging to Type I. However, supervisors who have not had specific training for school library supervision tend to have had a wider variety of administrative and supervisory positions than those specifically trained.

The findings reveal that Type I supervisors give more services than Type II. The former apparently excel in the following areas: services pertaining to books and magazines; advisory services pertaining to library quarters and equipment; services pertaining to preparation of library budgets and allocation of funds to individual libraries; services pertaining to instructional programs; library publicity activities; activities pertaining to selection and placement of librarians; memberships in national, regional and local professional organizations. Type II supervisors do not excel in any of the above mentioned areas. Little has been done to evaluate school libraries under either the Cooperative Study of Secondary School Standards or by local staffs under supervisors representing Type I or II.

Both classes of supervisors consider a liberal arts background the most important academic training for supervisory positions. Courses in library administration are thought most essential professional training by both kinds of supervisors. On the other hand, teaching experience is considered more necessary to supervisory positions by specifically qualified supervisors than by those not so qualified.

During the period from 1938 to 1948 supervisors classified as Type I contributed more to the development of their library systems than those classified as Type II. Major accomplishments of the firs t class included: increased library budgets; establishment of many new elementary and secondary school libraries; improved training and certification standards for librarians; numerous new library services. Findings do not indicate such outstanding accomplishments under the second class. During the period under investigation, library research did not seem to be an important activity of either class of supervisors. The only research activity reported was study of school library programs for the purpose of making recommendations to school administrators.

The findings reveal, furthermore, that services provided through supervisory programs under the direction of Type I supervisors more adequately meet the needs of librarians in developing individual library programs than those supplied under the direction of Type II. Under both types of supervisors secondary school librarians consider classifying, cataloging, shelf-listing and mechanical book preparation the technical processes which most need centralizing. Other supervisory services and activities which librarians do not have under supervisors not specifically qualified for their work, yet are considered by them to be essential to the library program, include a model collection of books for school libraries and supervisory aid in organizing student assistant groups. Apparently librarians supervised by Type I supervisors who do not hold departmental meetings for the purpose of in-service education for trained and untrained librarians, consider such meetings essential to the development of individual school library programs.

The findings of the survey permit certain conclusions to be drawn regarding supervisory programs under the two types of school library supervisors studied. However, they must be accepted in the light of limited sampling, which was thirty-four programs, eighteen administered by Type I and 16 by Type II supervisors.

Within this limitation the findings can be interpreted as evidence that qualifications of the supervisors have a pronounced effect on the services given to librarians directly, and through the central library office. Services considered by librarians to be essential to the development of individual library programs are supplied by Type I more often than by Type II supervisors. Centralized technical services, much valued by them, are given less frequently under the second class than under the first class of supervisors. Specifically qualified supervisors, as a group, excel those not so qualified in maintaining central collections of books and other library materials. Furthermore, the type of supervisor seems to be a factor strongly influencing the kind of in-service library training provided trained and untrained library personnel.

The second group of supervisors appear to be responsible for a greater number of non-library activities and are therefore not able to provide as many library services as the first, who are occupied solely with library supervisory programs. Facts also suggest that qualifications of supervisors have a marked influence on the coordinated development of school library programs.

The qualifications of supervisors appear to determine the amount and kind of educational background, professional training and business experience considered by them to be essential to the position.

In general, then, city secondary school library programs would appear to have more opportunity for development under Type I supervisors than under Type II. This could easily be because Type I is more often allowed to concentrate on the development of the library program, and has more specific training and experience for the postion.

A STUDY OF SEVERAL PSYCHOMETRIC TESTS AS A BASIS FOR GUIDANCE ON THE JUNIOR HIGH SCHOOL LEVEL

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Introduction

The general interest at the present time in the educational and vocational guidance of public school pupils led the writer of this study to undertake a testing program in the Junior High School of Morgantown, West Virginia.

It was thought that if we could have an evaluation of each pupil's mental ability, the level of his present achievement in the fundamental studies of the school curriculum, some idea of his aptitudes in the several lines of work in which a large percentage of the adult population engages, and a picture of his personality and social adjustment, such data would serve as a basis for guidance.

With the cooperation of the Principal of the school and the County Superintendent of Schools, a plan of testing was carried out during the second semester of 1947-48. The tests were given to the seventh and eighth grades, but this report deals only with the eighth grade.

Choice of Tests

An effort was made to select tests which have proved to be reliable, valid and of diagnostic value. With this in mind, the following tests were chosen for the program as best suited to our purpose:

1. Otis Quick Scoring Mental Ability Test, Beta, Form A
2. The Coordinated Scales of Attainment
3. The Minnesota Vocational Tests for Clerical Workers
4. The Minnesota Paper Form Board Test
5. Brown Personality Inventory for Children

1. Otis Quick Scoring Mental Ability Test, Beta, Form A:

In addition to the fact that the Otis Quick Scoring Mental Ability Test met the above criteria, it has the advantage of being self-administering and therefore consuming relatively little time. Its disadvantage is in having only a single score when the relationship of intelligence and the several subjects of the achievement test are to be compared, e.g., the relationship between intelligence and language or arithmetic.

2. The Coordinated Scales of Attainment:

The Coordinated Scales of Attainment Test was selected because it has proved satisfactory to the local school authorities. This test includes all of the school subjects, but in this study only four of the subjects were considered—Language Arts, Reading, Arithmetic Computation, and Problem Reasoning. These were chosen because they are fundamental and because they were believed to be those least influenced by the different texts or the varying interests of teachers.

3. The Minnesota Vocational Tests for Clerical Workers:

The Minnesota Vocational Tests for Clerical Workers was selected (1) because many junior high school pupils think that they wish to go into the clerical field, which is already overcrowded, and (2) because there are available norms for Grade 8 for the two sexes on these tests.

The authors[1] of the Minnesota Clerical Tests state that it is an aptitude test which measures speed and accuracy, and is useful in the selection of clerical employees and in the advising of persons who wish to seek training in the clerical field. It is a test which measures an aptitude that is positively related to the abilities to discriminate small differences rapidly, to observe and compare, to adjust to a new situation, and to give attention to a problem. Other investigators have found it relatively independent of spatial, dexterity and academic abilities;[2] while still others have found it useful as an instrument in the prog-

1. Dorothy M. Andrews and Donald G. Paterson. Minnesota Vocational Test for Clerical Workers, Revised (New York: The Psychological Corporation, 1946).

2. D. M. Andrews. "Analysis of the Minnesota Vocational Test for Clerical Workers I and II," Journal of Applied Psychology, XXI, pp. 18-47; 139-172.

noses in shorthand, typewriting and bookkeeping;[3] also for linotype trainees.[4] Consequently, it was thought that if the students showed no aptitude for this type of work they would be happier if they were guided in some other direction. The test consists of two parts, a number cnecking and a name checking, for each of which there are norms.

4. The Revised Minnesota Paper Form Board Test:

The Revised Minnesota Paper Form Board Test was selected in order to secure some measure of mechanical aptitude and because norms for ages 9, 10, 11, 12 and 15 are provided. It has been found to have a relatively high validity for the prediction and measurement of mechanical ability of those persons who were unfamiliar with tools and machines. Moreover, according to several investigators, it has been successfully used for admission to technical and industrial schools,[5] is predictive of achievement in Elementary Machine Detail Drafting,[6] and for success on jobs such as pressmen and machine operators.[7]

5. The Brown Personality Inventory for Children:

The Brown Personality Inventory for Children was chosen because it is short, easy to score, and classifies the responses into several categories, so that any maladjustment might be easily located.

It classifies the maladjustments into five categories, namely, (1) the home, (2) the school, (3) physical symptoms, (4) feelings of insecurity, and (5) irritability. The test is designed for pupils from the fourth to ninth grade, and can be administered to groups or in the form of an interview. In this study, the group method was used.

Treatment of Data

The tests were administered in the order listed above, according to the standardized directions and scored according to the standard norms published with the tests. The results of each test are reported in several ways, depending upon the plan set up for the various tests. The discussion of the results appears in two main parts: Part I considers mainly the distribution of scores and their percentile classification; Part II deals with the relationship between the several tests.

PART I

The general method of treatment of the data in Part I was first to tabulate the record for each pupil on all the tests. These records were turned over to the guidance officer for his use in dealing with each individual pupil. Then from these data, tables were constructed and graphs drawn, after which some conclusions were made. The tables and graphs show the results for each test.

1. The Otis Quick Scoring Mental Ability Test:

The data derived from the Otis Quick Scoring Mental Ability Test for each section and the total number are given in terms of range and median measures for chronological age, test score, and intelligence quotient, and appear in Table I. Table II shows the number and percent of pupils making the various I. Q. 's in accordance with the generally accepted Terman classification. The distribution of I. Q. 's is shown in Figure 1.

2. The Coordinated Scales of Attainment:

All scores on the Coordinated Scales of Attainment are "derived" scores; that is, they are derived from the number of right answers or raw score according to the author's tables. The derived scores and corresponding percentiles[8] in terms of range and median for the Language Arts, Reading, Arithmetic Computation, and Problem Reasoning are shown for each section of the class in Tables III and IV. Tables V and VI present

3. E. G. Eriksen et al. A Demonstration of Individual Training Methods for Modern Office Workers, Employment Stabilization Research Institute, Bulletin 3, No. 2 (Minneapolis: University of Minnesota, 1934).

4. G. C. Beamer, et al. "Improving Selection of Linotype Operators," Journal of Applied Psychology, XXXII (April 1948), pp. 130-134.

5. W. J. Morgan. "Some Remarks and Results of Aptitude Testing in Technical and Industrial Schools," Journal of Social Psychology, XX (June 1944), pp. 19-29.

6. John Edmund Crawford. Measurement of Some Factors Upon Which is Based Achievement in Elementary Machine Detail Drafting, Doctor's Dissertation, University of Pittsburgh, 1941.

7. O. M. Hall. "An Aid in the Selection of Pressmen Apprentices," Personnel Journal, IX (June 1930), pp. 77-85.

8. It may be well to note that each subject on the Coordinated Scales of Attainment has a separate set of percentiles so that a score in one subject does not correspond in percentile to a like score in another subject. For example, a score of

TABLE I

OTIS QUICK SCORING MENTAL ABILITY TEST—BETA, FORM A

Section	No. Pupils	Chronological Age		Score		Intelligence Quotient	
		Range	Median	Range	Median	Range	Median
8A1	27	14:10 12:10	13:11	68-35	46	120-92	98
8A2	16	14:10 12:6	13:9	59-29	42	110-79	95
8A3	27	15:0 13:1	13:11	73-32	47	130-84	99
8A4	24	16:9 13:1	13:6	63-23	46	117-70	97
8A5	16	16:0 12:2	14:5	51-29	38	110-62	91
8A6	31	15:2 12:0	13:4	70-36	52	121-89	107
8A7	35	14:7 12:6	13:7	72-38	59	127-91	111
8A8	27	15:9 12:1	13:6	75-42	53	132-85	105
Total	203	16:9 12:0	13:10	75-29	47	132-62	98

TABLE II

CLASSIFICATION OF INTELLIGENCE QUOTIENTS IN TERMS OF NUMBER AND PERCENT, OTIS QUICK SCORING MENTAL ABILITY TEST—BETA, FORM A

	120-140	110-120	90-110	80-90	70-80	60-70	Total
Grade	No. %	No. %	No. %	No. %	No. %	No. %	No. %
8A1	0-0	2-7	25-93	0-0	0-0	0-0	27-100
8A2	0-0	1-6	8-50	6-38	1-0	0-0	16-100
8A3	2-7	2-7	19-70	4-15	0-0	0-0	27-99
8A4	0-0	3-12	19-79	0-0	2-8	0-0	24-99
8A5	0-0	1-6	7-44	6-38	1-6	1-6	16-100
8A6	3-10	9-29	18-58	1-3	0-0	0-0	31-100
8A7	6-17	17-49	12-34	0-0	0-0	0-0	35-100
8A8	5-19	7-26	14-52	1-4	0-0	0-0	27-101
Total	16-7.8	42-20.6	122-60.1	18-8.8	4-2	1-.5	203-99.99

TABLE III

SCORES AND PERCENTILE RANK OF EACH SECTION IN TERMS OF RANGE AND MEDIAN FOR THE LANGUAGE ARTS AND READING

Language Arts					Reading				
		Score	Percentile Rank				Score	Percentile Rank	
Grade	Range	Med.	Range	Med.	Grade	Range	Med.	Range	Med.
8A1	27-57	(46)	20 to 75	(35)	8A1	30-60	(49)	10 to 85	(45)
8A2	-7-55	(-7)	-20 to 70	(-20)	8A2	28-53	(43)	10 to 65	(30)
8A3	22-57	(46)	-20 to 75	(35)	8A3	28-60	(49)	10 to 75	(45)
8A4	-7-56	(46)	-20 to 70	(35)	8A4	-9-58	(35)	10 to 75	(15)
8A5	-7-31	(22)	-20 to 20	(-20)	8A5	-9-49	(34)	10 to 45	(15)
8A6	25-70	(50)	-29 to 90+	(50)	8A6	35-95	(57)	15 to 90+	(75)
8A7	43-64	(53)	30 to 90	(60)	8A7	49-72	(63)	45 to 99	(90)
8A8	22-66	(49)	-20 to 90	(45)	8A8	40-68	(56)	25 to 99	(75)

TABLE IV

SCORES AND PERCENTILE RANK OF EACH SECTION IN TERMS OF RANGE AND MEDIAN FOR ARITHMETIC COMPUTATION AND PROBLEM REASONING

Arithmetic Computation					Problem Reasoning				
		Score	Percentile Rank				Score	Percentile Rank	
Grade	Range	Med.	Range	Med.	Grade	Range	Med.	Range	Med.
8A1	30-55	(44)	5-70	(25)	8A1	25-69	(50)	20-85+	(50)
8A2	22-43	(37)	-5-25	(10)	8A2	-27-54	(-27)	-20-60	(-20)
8A3	28-56	(44)	5-75	(25)	8A3	-27-62	(52)	-20-80	(55)
8A4	25-56	(44)	-5-75	(25)	8A4	-27-64	(50)	-20-85	(50)
8A5	17-37	(25)	-5-10	(-5)	8A5	-27-52	(27)	-20-55	(-20)
8A6	0-75	(45)	-5-95+	(30)	8A6	20-85	(57)	-20-85+	(70)
8A7	46-79	(59)	35-95+	(80)	8A7	48-78	(69)	45-85+	(85+)
8A8	40-68	(52)	15-95	(60)	8A8	-27-78	(58)	-20-85+	(70)

TABLE V

THE NUMBER AND PERCENT OF PUPILS IN EACH QUARTILE OF THE LANGUAGE ARTS AND READING TEST

	Language Arts						Reading				
	75-100	50-75	25-50	25—	Total		75-100	50-75	25-50	25—	Total
Grade	No. %	No. %	No. %	No. %	No.	Grade	No. %	No. %	No. %	No. %	No.
8A1	1-4	2-7	16-59	30-8	27	8A1	3-12	9-35	11-42	3-12	26
8A2	0-0	1-5	6-32	63-12	19	8A2	0-0	3-19	7-44	6-38	16
8A3	1-3	7-24	15-52	21-6	29	8A3	4-12	11-34	15-47	2-6	32
8A4	0-0	4-14	15-52	34-10	29	8A4	2-7	3-11	7-26	15-56	27
8A5	0-0	0-0	0-0	100-12	12	8A5	0-0	0-0	6-43	8-57	14
8A6	4-14	12-41	9-31	14-4	29	8A6	17-52	5-15	9-27	2-6	33
8A7	11-33	14-42	8-24	0-0	33	8A7	27-77	7-20	1-3	0-0	35
8A8	5-16	8-26	14-45	13-4	31	8A8	16-53	5-17	9-30	0-0	30
Total	22-11	48-23	83-40	56-27	209		69-32	43-20	65-31	36-17	213

Figure 1

Otis Quick Scoring Mental Ability Test

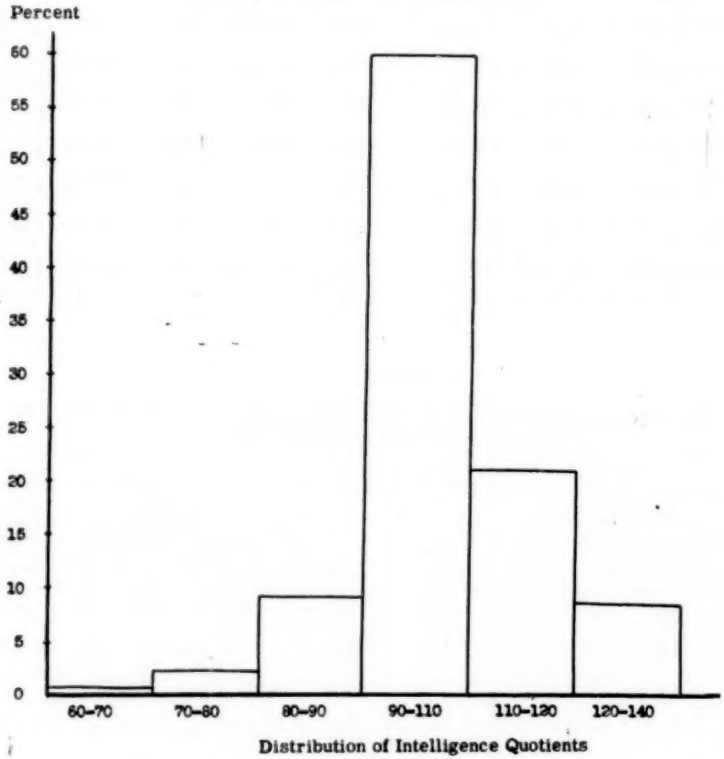
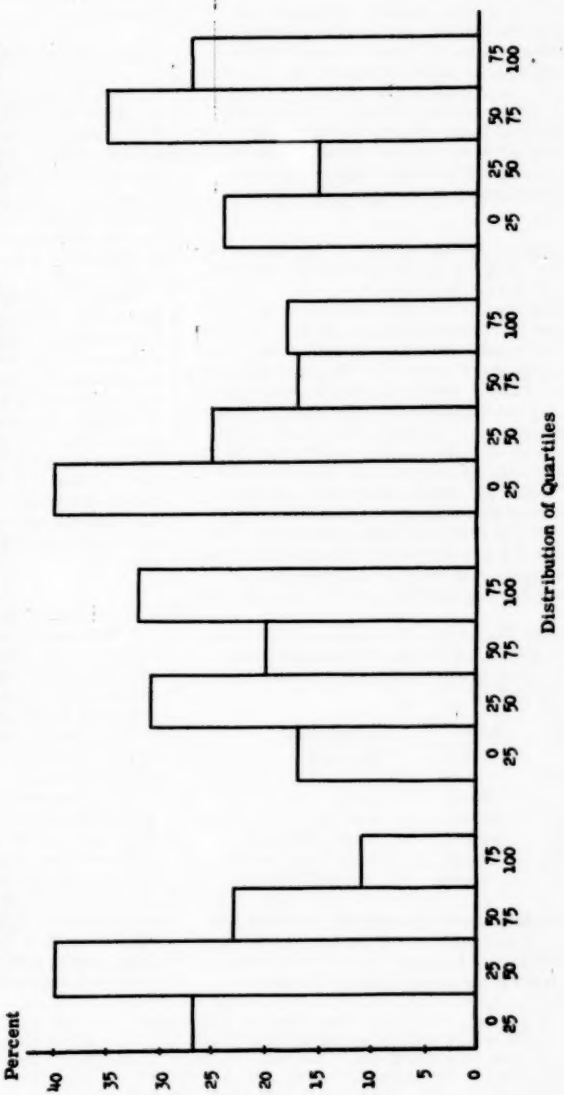


Figure 2

Coordinated Scales of Attainment



the number and percent of pupils in each quartile for the same subjects.

The results of the entire grade are shown in Table VII in terms of the number of pupils and the percent of the class found in each quartile for each of the four subjects. Since, from a statistical standpoint, only pupils falling in the lowest quartile would be considered definitely "below normal," a condensed table showing (1) number and percentage of pupils within "normal range" (100-25), and (2) those "below normal" (below 25) was drawn up. These data appear in Table VIII. The distribution of the quartiles appears in Figure 2.

3. The Minnesota Aptitude Tests—The Minnesota Vocational Test for Clerical Workers and The Minnesota Paper Form Board:

The treatment of the data obtained from the aptitude tests is similar to that of the Coordinated Scales of Attainment, with the exception that there is a breakdown of the scores for the girls and boys separately. This is seen in Table IX, which gives the range and the median percentile rank for each of the eight sections. Table X presents the number and percent of girls in each quartile for the three tests; Table XI presents the same data for the boys. Table XII shows the number and percent of pupils of the whole group together with the same data for the girls and boys separately. The data of Table XII are condensed in Table XIII which groups the pupils with percentile ranks from 25 to 100 in one column and those below 25 in another.

4. The Brown Personality Inventory for Children:

The scores of the Brown Personality Inventory for Children are grouped into quintiles by the author as follows:

	Score	Adjustment
Best 20%	0-8	Excellent
Second best 20%	9-14	Good
Middle 20%	15-20	Average
Fourth 20%	21-28	Below Average
Lowest 20%	29 and above	Very Poor, needs clinical attention

The first three quintiles contain scores which would classify the pupil as having average adjustment or better, and the last two as below average. If a pupil's score puts him in the lowest quintile, the author believes it indicates a need for clinical attention. The test results of the class on this Inventory appear in Table XIV and Figure 4.

Results of the Tests

1. The Otis Quick Scoring Test of Mental Ability:

This test was administered to 203 pupils. The median life age was found to be 13 years 10 months which is slightly higher than the average age of 13 years 6 months for this grade. The range is wide, from 12 years to 16 years 9 months of age, a difference of 4 years and 9 months between the youngest and oldest. In each section there are some over-age and some retarded pupils.

When the Intelligence Quotients are inspected (Table II), we find only one pupil has an I. Q. in the defective category; four are in the borderline; eighteen fall in the dull or backward group, which constitutes 8. 8 percent of the class. The remaining pupils would be classified as having average or better intelligence. They make up 88. 5 percent of the total; one section, 8A7, stands out as the highest section, and 8A5 as the lowest. However, a range of mental ability as measured by this test appears in each section, in spite of the fact that the school authorities had made an effort to secure homogeneous groups in each section.

2. Coordinated Scales of Attainment:

The second set of tests to be given was the battery of the Coordinated Scales of Attainment, the Language Arts, Reading Comprehension, Arithmetic Computation and Problem Reasoning being the parts used in this study.

The results as shown in Tables III, IV, V and VI are in terms of score and percentile, first, for each section and the class as a whole.

It is interesting to note that it is the 8A7 section which makes the best showing in both Language Arts and Reading with median percentiles of 60 and 90, respectively (Table III), and the section with the poorest record is 8A5 with median percentiles of -20 and 15 in Language Arts and Reading. It was section 8A5 that had the highest median life age and the lowest median I. Q., and is now found to have the poorest achievement in Language Arts and Reading; whereas it

45 in Arithmetic Computation yields a percentile rank of 30, but in Problem Reasoning a like score gives a percentile rank of 35. Moreover, the lowest percentile given by the standardized "Percentile Rank Indicator" varies with each subject. For example, with Language Arts the lowest score recorded is 7 and the lowest percentile rank is 20, whereas in Reading the lowest score is 9 and the lowest percentile rank is 10. However, any score below 36 in Language Arts for the eighth grade would be scored (-20) percentile rank, and in Reading, if the score falls below 29, it would be given (-10) percentile rank. The same variability occurs at the other extreme, or for the high scores.

Figure 3

Minnesota Aptitude Tests

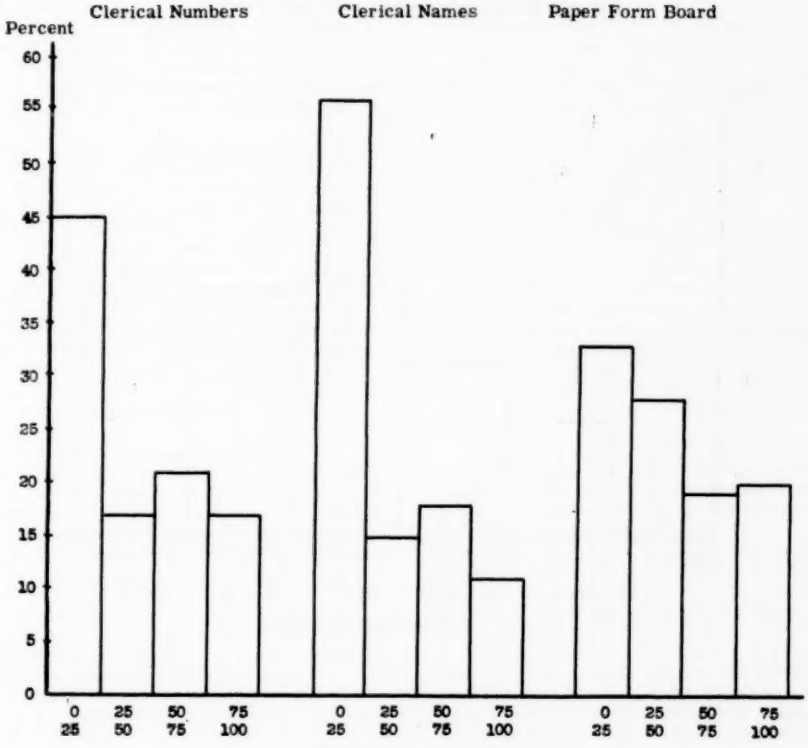
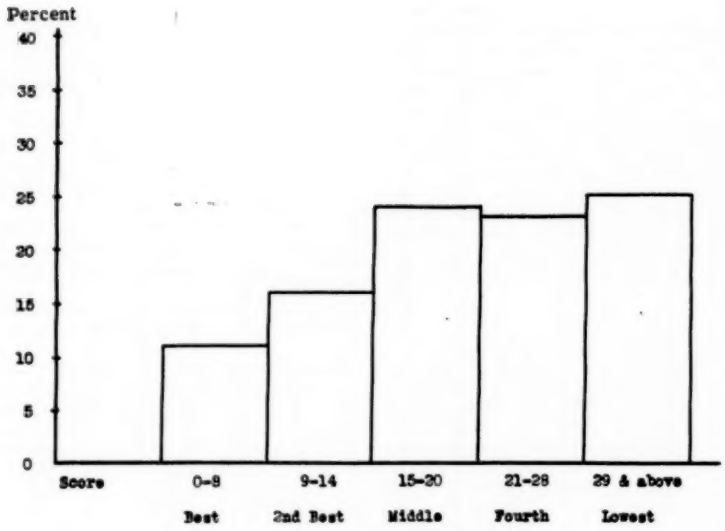


Figure 4

Brown Personality Inventory for Children



was section 8A7 that had a median life age in keeping with grade placement but ranked first in intelligence (Table I).

According to Table III the median percentiles for all sections are higher in Reading Comprehension than in the Language Arts. This is further brought out in Table V and in the Condensed Table VIII where we find that 83 percent have a percentile rank above 25 in Reading while only 74 percent have the same rank in the Language Arts. If we make 50 percentile (Table VII) the dividing line, we find 112 out of the 213 who took the Reading Comprehension test above that mark, but only 70 of the 209 who took the Language Arts test placing above 50 percentile. Or putting it another way, there are twice as many below the 50 percentile rank as above in the Language Arts, while in Reading Comprehension there are a few more above the 50 percentile than below that mark (112 to 101).

Tables IV and VI present the results of Arithmetic Computation and Problem Reasoning in terms of the range and median for score and percentile rank. Table IV points out once more the superiority of the 8A7 section in both subjects over all other sections. The lowest rank is still held by the 8A5 group whose score in both was lower than any recorded in the standards. Table VI confirms the above, as we find none of the 8A7 group in the lowest quartile and the largest number in the top quartile in both Computation and Problem Reasoning, while all pupils in the 8A5 section are in the lowest quartile in Computation, and in Problem Reasoning none reach the first quartile.

The striking fact brought out in Table VII is similar to that noted in regard to Language and Reading, namely, that there are nearly twice as many making below 50 percentile in Computation as there are above (143 as against 76). The opposite is true in regard to Problem Reasoning where 137 of the 219 rank above the 50 percentile while 82 fall below.

The condensed Table VIII shows 76 percent of the class with percentile ranks above 25 in Problem Reasoning, while only 60 percent attain that status in Arithmetic Computation.

As seen then by Tables III, IV, V, VI, VII, and VIII, the ability of the majority of this class is below the mid-point in Language Arts and Arithmetic Computation as judged by the median percentile rank derived from the median score as set forth in the author's norms. In other words, they are not up to par in the "tool" subjects. In Reading and Problem Reasoning they make a better showing.

Aptitude Tests

The next set of tests administered was the Minnesota Aptitude Tests for Clerical Ability, consisting of two parts, namely, Number Checking and Name Checking, and the revised Paper Form Board Test.

The results are shown in Tables IX, X, XI, XII, and XIII, and Figure 3. In Table IX, the results have been tabulated for each section, with girls and boys treated separately.

Considering first the results of the Clerical Test, Table IX shows that for Number Checking the median score for girls surpasses that of the boys in four sections. They tie in two, and in the other two, the median score of the boys exceeds the girls.[9] In Name Checking the girls surpass the boys in five sections, tie in one and fall behind the boys in two sections.

Tables X and XI show for each section the number and percent of girls and boys respectively who fall within each quartile. Here we see that for both parts of the test (Number Checking and Name Checking) a much smaller percentage of the class comes above the 50 percentile rank than below, regardless of sex. For girls, 37 are above as against 63 who are below for numbers; and 34 against 66 for names; for boys, 38 against 62 for numbers, and 23 against 77 for names.

However, a slightly larger percentage does better on checking numbers than on checking names. There is little difference between the sexes as to number checking, but an appreciable difference appears in name checking.

Considering next the results on the Paper Form Board Test we turn again to Table IX. Here we see that the median score for girls exceeds that of boys in six of the eight sections, boys being in the ascendency in only two.

Tables X and XI which classify girls and boys separately in terms of number and percentile rank for each section and for the class as a whole, show that girls surpass the boys in mechanical ability as measured by this test. However, the differences in the sexes is less marked than in the clerical tests and the percentage of the class

9. Note should be taken of the fact that a higher score is required for girls than for boys in each percentile. For example, a percentile rank of 50 requires a score of 100 for girls, but only 85 for boys. In 8A1, the mean score of the girls on the number checking test was 95.1 while that of the boys was 80.9. The percentile rank of both, however, was 40. There was a noticeable difference on the name checking; the girls having a mean score of 83.2 with a corresponding percentile rank of 30, while the boys had a mean score of 70.5 with a percentile rank of 40.

TABLE VI

NUMBER AND PERCENT OF PUPILS IN EACH QUARTILE OF THE ARITHMETIC COMPUTATION AND PROBLEM REASONING TESTS

	Arithmetic Computation						Problem Reasoning				
	75-100	50-75	25-50	25—	Total		75-100	50-75	25-50	25—	Total
Grade	No. %	No. %	No. %	No. %	No.	Grade	No. %	No. %	No. %	No. %	No.
8A1	1-3	6-19	11-35	13-42	31	8A1	5-17	12-41	8-28	4-14	29
8A2	0-0	0-0	1-5	20-95	21	8A2	0-0	2-11	4-21	13-68	19
8A3	2-6	5-16	11-34	14-44	32	8A3	6-20	14-47	4-13	6-20	30
8A4	1-4	2-9	8-35	12-52	23	8A4	2-8	14-54	3-12	7-27	26
8A5	0-0	0-0	0-0	13-100	13	8A5	0-0	2-12	5-31	9-56	16
8A6	3-9	5-14	13-37	14-40	35	8A6	12-34	18-51	3-9	2-6	35
8A7	22-67	9-27	2-6	0-0	33	8A7	24-73	7-21	2-6	0-0	33
8A8	10-32	10-32	9-29	2-6	31	8A8	11-35	8-26	1-3	11-35	31
Total	39-18	37-17	55-25	88-40	219		60-27	77-35	30-15	52-24	219

TABLE VII

COORDINATED SCALES OF ATTAINMENT PERCENTILE RANKS IN TERMS OF NUMBER AND PERCENT OF PUPILS IN EACH

	75-100	50-75	25-50	00-25
Tests	No. %	No. %	No. %	No. %
Language Arts	22-11	48-23	83-40	56-27
Reading	69-32	43-20	65-31	36-17
Arithmetic Computation	39-18	37-17	55-25	88-40
Arithmetic Problem Reasoning	60-27	77-35	30-15	52-24

TABLE VIII

CONDENSED DATA ON COORDINATED SCALE OF ATTAINMENT PERCENTILE RANKS IN TERMS OF NUMBER AND PERCENT OF PUPILS

Tests	%ile Rank 25 to 100		%ile Rank Below 25		Total
	No. Pupils*	Percent	No. Pupils*	Percent	No. Pupils*
Language Arts	155	74	56	27	209
Reading	177	83	36	17	213
Arithmetic Computation	131	60	88	40	219
Arithmetic Problem Reasoning	167	76	52	24	219

*Because of absences at the time the different tests were administered the number of pupils taking each test fluctuates. The total number present is indicated in the tables.

TABLE IX

RESULTS OF THE MINNESOTA APTITUDE TESTS FOR GIRLS AND BOYS IN TERMS OF PERCENTILE RANK WITH RANGE AND MEDIAN FOR EACH SECTION

	Minnesota Clerical				Minnesota Paper Board Form	
	Numbers		Names			
Grade	Range	Median	Range	Median	Range	Median
8A1						
Girls	10-80	(40)	10-70	(25)	5-90	(35)
Boys	1-80	(50)	1-90	(30)	5-80	(13.5)
8A2						
Girls	3-20	(9)	1-35	(10)	-5-36	(17.5)
Boys	-1-40	(5)	1-50	(7.5)	-5-15	(7.5)
8A3						
Girls	3-70	(33)	4-93	(59)	7-97	(35)
Boys	0-89	(19)	5-70	(19)	8-65	(31)
8A4						
Girls	20-100	(72.5)	1-50	(5)	21-97	(75)
Boys	50-100	(90)	1-20	(10)	13-60	(37.5)
8A5						
Girls	10-30	(10)	-1-20	(1)	-5-15	(2.5)
Boys	-1-50	(10)	-1-20	(1)	-5-35	(10)
8A6						
Girls	1-60	(10)	10-70	(30)	10-90	(40)
Boys	1-80	(10)	10-100	(27.5)	-5-90	(47.5)
8A7						
Girls	9-93	(58)	20-91	(78)	0-100	(72.5)
Boys	9-90	(37.5)	7-91	(40)	4-95	(55)
8A8						
Girls	10-92	(60)	10-92	(30)	25-100	(65)
Boys	1-90	(47.5	6-60	(20)	10-95	(60)

in each quartile is more evenly distributed. But for both sexes the two lower quartiles are more heavily loaded. This is particularly noticeable for the boys.

As regards the position of the sections, once again we see that section 7 consistently leads and section 5 is at the bottom. Tables XII and XIII confirm the above statements.

Brown Personality Inventory for Children Grade 8A

The Brown Personality Inventory for Children was given to 219 pupils in the eighth grade. The scores were classified according to quintiles, as follows:

Quintile	Score	Adjustment
Best 20%	0-8	Excellent
Second best 20%	9-14	Good
Middle 20%	15-20	Average
Fourth 20%	21-28	Below average
Lowest 20%	29 and above	Very Poor, needs clinical attention

The results are shown in Table XIV.

It can be seen from this table that the 8A7 section is by far the best adjusted group, with 77% rating average or above. The second best adjusted is 8A2, with 60% average or above. Then next in order come sections 8A3, 8A5 and 8A8 with 50% average or above, followed by 8A1 and 8A4 with 46% and 45%, respectively, rating average or above. The most poorly adjusted section is the 8A6 section where only 30% reach an average or above rating.

Home room teachers of two sections, 8A2 and 8A8[10] were asked to confirm or deny the ratings given by the tests. In the 8A2 group, 60% of the ratings were confirmed, 40% denied. In the 8A8 section, confirmation was given to 71.4% and denials to 28.6% of the test ratings. The tabulated results below show the percentages of confirmations and denials for the two sections when broken down into quintiles:

It is interesting to note that there is complete confirmation in the Middle 20% for both grades; also in the Second Best 20% for 8A8. For both grades there is a two thirds confirmation in the Fourth 20%. Apparently it is easier to rate personality adjustment more accurately in the middle ranges than at the extremes.

This discrepancy between estimates of teachers and test results can be understood in part when we consider the arbitrary divisions made of the scores. For example, a score of 8 gives one an "excellent" rating, while one of 9 is "good." Likewise, a score of 28 rates one as "below average," but one of 29 puts him in the "very poorly adjusted" group. Thus a difference of one point makes for a different classification. On the other hand, the teacher may consider a child well or poorly adjusted according to his behavior in the classroom, without taking into consideration other factors which may play a larger part in his total adjustment.

A detailed study was made of each pupil in the 8A8 and 8A5 sections. When the inventory scores were studied in terms of the five categories, namely, Home, School, Physical Symptoms, Insecurity, Irritability, it was not infrequent to find a case showing good school adjustment but poor home adjustment, insecurity or irritability, whereas other cases showed only poor school adjustment. Naturally, the latter are the cases the teachers consider maladjusted.

Discussion and General Conclusions

1. Otis Quick Scoring Mental Ability Test

Accord ing to the results of this test, we can say that the pupils of the eighth grade were generally speaking properly placed according to their chronological age, although the range in chronological age, mental age, and I.Q.'s was great, throwing young and old, bright and dull together. The school authorities tried to correct this condition by dividing the class into homogeneous sections. But in spite of their efforts there remained a rather wide range in both age and intelligence in all sections, with the younger chil-

	Best 20%		2nd Best 20%		Middle 20%		Fourth 20%		Lowest 20%	
	Confirm	Deny	Confirm	Deny	Confirm	Deny	Confirm	Deny	Confirm	Deny
8A2	50	50	50	50	100		66 2/3	33 1/3	60	40
8A8	60	40	100		100		66 2/3	33 1/3	40	60

10. These two sections were chosen because of the personnel of the class. The 8A2 section was judged by the school authorities as a slow group, being particularly backward in Reading. Had the superior group, 8A7, been selected for detailed study, it is quite possible the percentage of agreement might have been higher.

TABLE X

THE NUMBER AND PERCENT OF GIRLS IN EACH QUARTILE OF THE MINNESOTA APTITUDE TESTS, CLERICAL AND FORM BOARD, ACCORDING TO SECTIONS

	Clerical Numbers								
Percentile Rank	No. of pupils % 8A1	No. of pupils % 8A2	No. of pupils % 8A3	No. of pupils % 8A4	No. of pupils % 8A5	No. of pupils % 8A6	No. of pupils % 8A7	No. of pupils % 8A8	Total
75-100	2-11	0-0	0-0	7-37	0-0	0-0	7-37	3-16	19-17
50-75	5-23	0-0	5-23	2-9	0-0	1-5	4-18	5-23	22-20 / 37
25-50	6-23	0-0	5-19	4-15	1-4	5-19	4-15	1-4	26-23
0-25	3-7	14-32	5-14	1-2	3-7	11-25	2-5	4-9	44-40 / 63
Total	16	14	16	14	4	17	17	13	111
	Clerical Names								
75-100	1-6	0-0	4-24	0-0	0-0	1-6	9-53	2-12	17-15
50-75	3-14	0-0	6-29	1-5	0-0	6-29	4-19	1-5	21-19 / 34
25-50	4-27	1-7	0-0	0-0	0-0	3-20	1-7	6-40	15-14
0-25	8-14	13-22	6-10	13-22	4-7	7-12	3-5	4-7	58-52 / 66
Total	16	14	16	16	4	17	17	13	111
	Revised Paper Form Board								
75-100	3-11	0-0	4-15	6-22	0-0	1-4	7-26	6-22	27-27
50-75	4-25	0-0	1-6	1-6	0-0	4-25	3-19	3-19	16-16 / 43
25-50	2-7	3-10	7-24	3-10	0-0	8-28	3-10	3-10	29-28
0-25	7-23	9-30	3-10	1-3	4-13	3-10	3-10	0-0	30-29 / 57
Total	16	12	15	11	4	16	16	12	102

TABLE XI

THE NUMBER AND PERCENT OF BOYS IN EACH QUARTILE OF THE MINNESOTA APTITUDE TESTS, CLERICAL AND FORM BOARD, ACCORDING TO SECTIONS

	Clerical Numbers								
Percentile Rank	No. of pupils % 8A1	No. of pupils % 8A2	No. of pupils % 8A3	No. of pupils % 8A4	No. of pupils % 8A5	No. of pupils % 8A6	No. of pupils % 8A7	No. of pupils % 8A8	Total
75-100	1-5	0-0	1-5	11-58	0-0	1-5	3-16	2-11	19-17
50-75	6-25	0-0	3-17	3-17	1-4	5-21	5-21	5-21	24-21 / 38
25-50	2-15	2-15	2-15	0-0	0-0	2-15	4-31	1-8	13-12
0-25	5-9	6-11	9-16	0-0	10-18	14-25	6-11	7-12	57-50 / 62
Total	14	8	15	14	11	18	18	15	113
	Clerical Names								
75-100	1-14	0-0	0-0	0-0	0-0	2-29	4-57	0-0	7-6
50-75	2-11	1-5	3-16	0-0	0-0	4-21	5-26	4-21	19-17 / 23
25-50	5-26	0-0	4-21	0-0	0-0	4-21	4-21	2-11	10-17
0-25	6-9	7-10	8-12	14-20	11-16	8-12	5-7	8-12	67-60 / 77
Total	14	8	15	14	11	18	18	14	112
	Revised Paper Form Board								
75-100	2-12	0-0	0-0	0-0	0-0	4-25	6-38	4-25	16-15
50-75	2-9	0-0	3-13	4-17	0-0	5-22	5-22	4-17	23-22 / 37
25-50	0-0	0-0	8-28	7-24	3-10	2-7	4-14	5-17	29-27
0-25	6-16	8-21	5-13	3-8	5-13	7-18	3-8	1-3	38-36 / 63
Total	10	8	16	14	8	18	18	14	106

TABLE XII

MINNESOTA APTITUDE TESTS: PERCENTILE RANKS IN TERMS OF NUMBER AND PERCENT OF THE TOTAL GROUP WITH GIRLS AND BOYS LISTED SEPARATELY

	Percentile Ranks				
	75-100	50-75	25-50	0-25	
Tests	No. of pupils %	No. of pupils %	No. of pupils %	No. of pupils %	Total No. of Pupils
Clerical Numbers	38-17	46-21	39-17	101-45	224
Girls	19-17	22-20	26-23	44-40	111
Boys	19-17	24-21	13-12	57-50	113
Clerical Names	24-11	40-18	34-15	125-56	223
Girls	17-15	21-19	15-14	58-52	111
Boys	7-6	19-17	19-17	67-60	112
Form Board	43-20	39-19	58-28	68-33	208
Girls	27-27	16-16	29-28	30-29	102
Boys	16-15	23-22	27-27	38-36	106

TABLE XIII

CONDENSED DATA ON THE MINNESOTA APTITUDE TESTS: PERCENTILE RANKS IN TERMS OF NUMBER AND PERCENT OF PUPILS

		Percentile Rank				
		25 to 100		Below 25		
Tests		No. of Pupils %	Percent	No. of pupils %	Percent	Total No. of Pupils
Clerical Numbers	Total	123	55	101	45	224
	Girls	67	60	44	40	111
	Boys	56	50	57	50	113
Clerical Names	Total	98	44	125	56	223
	Girls	53	48	58	52	111
	Boys	45	40	67	60	112
Form Board	Total	139	67	68	33	208
	Girls	72	71	30	29	102
	Boys	68	64	38	36	106

dren having the higher I. Q. 's. This raises the question of the advisability of separating over-age pupils from the younger ones. In many cases, the older pupils' mental ability was definitely below eighth grade standard, and their promotion was probably due to consideration for their age and years of service. But for the majority, the mental ability as measured by this test is fairly promising.

2. Coordinated Scales of Attainment:

Judged by the scores the pupils made on these scales, they rank below the standard norms in the Language Arts that include punctuation, usage and capitalization, and in Arithmetic Computation. In these two tests only about one-third attain a 50 percentile rank. A larger percentage of them reach the standard norms in Reading and Problem Reasoning. This seems to indicate clearly that they need more drill and proficiency in Language and Arithmetic as tools before entering the Junior High School.

But why, lacking tool skill, do they make better scores in Reading Comprehension and Reasoning? Evidently their general mental ability is an aid in helping them perceive the general drift of content and leads to fairly good guessing. But that does not alter the fact that weakness in the skillful use of tools is a decided handicap in all phases of learning. If more emphasis were placed on drill in the tool subjects in the lower grades, where drill is not so distasteful to children, they would not be humiliated and handicapped by its lack when they reach Junior High School.

3. Minnesota Aptitude Tests

The most noticeable fact brought out by the results of the aptitude tests is the superiority of girls over boys, suggesting at least that girls have more clerical and mechanical ability than boys have, as measured by these tests. A like difference in clerical ability was noted by Schneider[11] who presented norms of grades 8 through 12, also by Loevioger[12] who studied the clerical ability of pupils in grade 7, and Thatcher[13] who studied pupils in grades 5 and 6.

Still another fact is that the class as a whole is poorer on name checking than number checking, less than 50 percent scoring average in the former. Is it possible that the wide use and scrutiny of telephone numbers is responsible for the better showing of number checking? Or can we put the blame for the poor showing on name checking on the method of teaching reading? Today there is little emphasis placed on the recognition of separate letters which the name checking test calls for.

The fact that the girls do better than boys on the Clerical Test, especially as regards name checking, suggests that possibly they would do better in typing, filing, and secretarial work than boys would, and that if the boys do go into the clerical field, it might be better for them to be in jobs dealing with numbers rather than names.

But on the whole the results of this test seem to indicate clearly that the majority of these Junior High School pupils are not destined for outstanding success in the clerical field, as judged by the small percentage falling at the 50 percentile rank or above. Although it is quite possible that many in the quartile of 50 to 25 percentile rank would be successful, especially if they possess certain other qualifications which would contribute to their success, such as mental ability, interest in the work and a certain type of personality.

A somewhat surprising result of the Form Board Test is that girls once more have the edge on the boys. Have teachers been wrong in assuming that boys are more mechanical than girls? But the big question that remains to be answered is: What must the schools do for the pupils with less than average ability along clerical and mechanical lines and who are not endowed by nature for the professions?

A problem confronts the guidance officer when he finds that pupils show poor ability in the much cherished field of the white collar worker, and even in the mechanical field. This becomes still more of a problem when general mental ability is below average. For example, frequently a pupil shows enough mechanical ability to construct model airplanes and he may even do well on certain mechanical aptitude tests. This leads him and his parents to believe he should become a professional engineer, but a glance at his record on Arithmetic Computation and Problem Reasoning would cast doubt on his ultimate success, even though he may have a certain liking or ambition for that field.

4. Brown Personality Inventory for Children:

According to this test, 51 percent or one-

11. G. C. Schneider. "Grade and Age Norms for the Minnesota Vocational Test for Clerical Workers," Educational and Psychological Measurements (1941), pp. 143-156.

12. J. Loevinger. An Analysis of Verbal and Numerical Abilities at the Junior High School Level, Master's Thesis in Psychometrics, University of Minnesota, 1938.

13. M. Thatcher. Sex Differences in Clerical Ability at the Fifth and Sixth Grade Levels, Unpublished paper, Department of Psychology, University of Minnesota, 1940. Pp. 1-12.

TABLE XIV

BROWN PERSONALITY INVENTORY FOR CHILDREN ACCORDING TO SECTIONS

Sections	0-8 Best 20% No. pupils	%	9-14 2nd Best 20% No. pupils	%	15-20 Middle 20% No. pupils	%	21-28 Fourth 20% No. pupils	%	29 and Above Lowest 20% No. pupils	%	Average and better No. pupils	%	Below Average No. pupils	%	Total No. pupils
8A1	1	3	4	13	9	30	8	27	8	27	14	47	16	53	30
8A2	2	10	8	40	2	10	3	15	5	25	12	60	8	40	20
8A3	2	7	6	20	7	23	7	23	8	27	15	50	15	50	30
8A4	2	7	3	10	8	28	6	21	10	34	13	45	16	56	29
8A5	1	7	0	0	6	43	3	21	4	29	7	50	7	50	14
8A6	3	9	1	3	6	18	10	30	13	39	10	30	23	70	33
8A7	11	31	8	23	8	23	6	17	2	6	27	77	8	23	35
8A8	5	18	5	18	4	14	9	32	5	18	14	50	14	50	28
Total Class	27	11	35	16	50	24	52	23	55	25	112	51	107	49	219

TABLE XV

RANGE OF SCORE, MEAN SCORE, STANDARD DEVIATION, AND COEFFICIENT OF CORRELATION FOR EACH OF THE NINE SEPARATE TESTS

Name of Test	No. of Cases	Range of Scores	Mean Score	Standard Deviation	Coef. of Correl.	P. E. of r
Otis Quick Scoring Mental Ability	133	23-72	50. 556	10. 05		
Language Arts	133	6-67	45. 195	11. 85	. 57	±. 05
Reading Comprehension	133	9-94	49. 714	13. 50	. 58	±. 05
Arithmetic Computation	133	5-79	46. 872	13. 45	. 62	±. 05
Problem Reasoning	133	27-85	52. 804	15. 35	. 55	±. 06
Minnesota Clerical Numbers	133	35-187	87. 375	24. 30	. 23	±. 08
Minnesota Clerical Names	133	26-174	77. 165	25. 20	. 48	±. 06
Minnesota Paper Form Board	133	3-58	33. 293	10. 80	. 33	±. 07
Personality Inventory	133	0-54	20. 691	10. 70	. 20	±. 08

TABLE XVI

INTERCORRELATIONS OF THE FOUR PARTS OF THE COORDINATED SCALES OF ATTAINMENT

Name of Test	Language Arts	Reading Compre.	Arithmetic Compu.	Problem Reasoning
Language Arts		+. 39±. 07	+. 44±. 07	+. 46±. 06
Reading Comprehension	+. 39±. 07		+. 57±. 05	+. 62±. 05
Arithmetic Computation	+. 44±. 07	+. 57±. 05		+. 57±. 05
Problem Reasoning	+. 46±. 06	+. 62±. 05	+. 57±. 05	

TABLE XVII

INTERCORRELATIONS BETWEEN THE THREE PARTS OF THE MINNESOTA APTITUDE TESTS: ARITHMETIC COMPUTATION AND CLERICAL NUMBERS; READING COMPREHENSION AND CLERICAL NAMES

Name of Test	Minnesota Clerical Numbers	Minnesota Clerical Names	Minnesota Form Board	Arithmetic Compu.	Reading Compre.
Minnesota Clerical Numbers		+.40±.07	+.37±.07	+.37±.07	
Minnesota Clerical Names	+.40±.07		+.30±.07		+.47±.06
Minnesota Form Board	+.37±.07	+.30±.07			
Arithmetic Computation	+.37±.07				
Reading Comprehension		+.47±.06			

half of the 219 pupils who took this test have average or better adjustment to life in general as may be expected, but 26 percent or one-fourth of the grade are so poorly adjusted as to need clinical attention. Yet many of those needing clinical attention were not so recognized by their teachers.

The best adjusted section was 8A7. It also ranked highest on the intelligence, achievement and name checking tests, but dropped to third place on number checking and paper form board tests. Could it be that their dropping to third position on number checking and the form board is due to the failure of those tests to challenge them as the more academic subjects do?

On the other side of the ledger is section 8A5, which had the lowest median I. Q. (91). This section has the lowest rank in all of the achievement tests studied, and in all of the aptitude tests, but according to the Brown Personality Inventory shows average adjustment. In general, then, is it poor mental ability that is responsible for poor achievement and aptitude or is it poor personality adjustment which retards mental development and skill in aptitude tests and thus makes for poor achievement? Or are both factors of major consideration? This question leads to Part II of this study, a study of correlations between the scores on the various tests.

PART II

The Purpose

The purpose in undertaking Part II of this study was to determine any statistical relationship which may exist between mental ability, as measured by the Otis Quick Scoring Test of Mental Ability, Beta Form A and Language Arts, Reading Comprehension, Arithmetic Computation and Problem Reasoning as measured by the Coordinated Scales of Attainment; aptitudes as measured by the Minnesota Paper Form Board and Clerical Aptitude Tests—Number Checking and Name Checking; and personality adjustment as measured by the Brown Personality Inventory. The method used to determine the relationship was Pearson's Product Moment Coefficient of Correlation.

The Subjects

The subjects were the pupils in the eighth grade in the Morgantown, West Virginia, Junior High School, for whom there were scores on all of the above mentioned tests. This reduced the number greatly, as there were only 133 pupils who met that requirement, although as was noted in Part I, 203 took the Otis Mental Ability Test; 209 the Language Arts; 213 Reading Comprehension; 219 Arithmetic Computation and Problem Reasoning; 224 and 223, respectively, the Clerical Numbers and Clerical Names; 208 the Paper Form Board, and 219 the Brown Personality Inventory. The reason for using only those with scores for the whole battery was to avoid the confusion of having a different set of figures for the same factors from correlation to correlation. The lack of complete set of scores for each pupil was due to absences from class at the time certain tests were administered.

The Treatment of the Data

The data for the study of relationship between the several tests are presented in Tables XV, XVI, and XVII. Table XV gives for each of the nine separate tests administered, the range of score, the mean score, the standard deviation, and the coefficient of correlation, (1) between the Otis Quick Scoring Mental Ability Test scores and the scores of the four parts of the Coordinated Scales of Attainment—Language Arts, Reading Comprehension, Arithmetic Computation and Problem Reasoning; (2) between the Otis Mental Ability Test scores and the scores of the Minnesota Aptitude Tests—Clerical Numbers, Clerical Names and the Revised Paper Form Board; and (3) between the Otis Mental Ability Test scores and those made on the Brown Personality Inventory.

Table XVI shows the intercorrelations of the four parts of the Coordinated Scales of Attainment mentioned above.

Table XVII shows the intercorrelations of the two parts of the Minnesota Clerical Test and the Revised Paper Form Board. Also it shows correlations between Arithmetic Computation and Clerical Numbers and between Reading Comprehension and Clerical Name Tests.

The Results

Since it is with the coefficient of correlations that we are most concerned in this part of the study, let us look first at Table XV. Here we see that mental ability as measured by the Otis Quick Scoring Mental Ability Test shows a definite relationship to academic achievement as measured by the Coordinated Scales of Attainment.

The coefficients of correlation are as follows: Language Arts +. 57 P. E. +. 05; Reading Comprehension +. 58 P. E. +. 05; Arithmetic Computation +. 62 P. E. +. 05; Problem Reasoning +. 55 P. E. +. 06.

Table XV shows that when the Otis Mental Ability Test scores are correlated with those of the Minnesota Aptitude Test scores, both Clerical and Form Board, the coefficients are considerably lower than those of the Otis and Achievement scores. They are as follows: Clerical Numbers +. 23 P. E. +. 08; Clerical Names +. 48 P. E. +. 06; Paper Form Board +. 33 P. E. +. 08.

Table XV also shows the coefficient of correlation between the Otis Mental Ability Test and the Brown Personality Inventory scores, which is +.20 P.E. +.08, the lowest of all the coefficients.

In Table XVI, which shows the intercorrelations of the four parts of the Coordinated Scales of Attainment, we find the highest coefficient of correlation is between Reading Comprehension and Problem Reasoning, which is +.62 P.E. +.05; the next highest is +.57 P.E. +.05 between Reading Comprehension and Arithmetic Computation although there is the same coefficient of correlation between Problem Reasoning and Arithmetic Computation. The Language Arts show a lower degree of correlation than do the other three parts. It is noticeably low with Reading Comprehension, being +.39 P.E. +.07, but somewhat higher with Arithmetic Computation and Problem Reasoning where the coefficients are +.44 P.E. +.07 and +.46 P.E. +.06, respectively.

The intercorrelations between the three parts of the Minnesota Aptitudes Tests are shown in Table XVII. The two parts of the Clerical Test, Names and Numbers, give a coefficient of +.40 P.E. +.07, but the correlation of the Paper Form Board with Clerical Numbers is only +.37 P.E. +.07 and with Clerical Names it drops to +.30 P.E. +.07.

In order to discover if there was a common factor in the tests of Reading Comprehension and Clerical Names, or in the Arithmetic Computation and Clerical Numbers, correlation coefficients were computed for the two sets of data. There resulted a coefficient of +.47 P.E. ±.07 between Reading Comprehension and Clerical Names, and a coefficient of +.37 P.E. ±.07 between Arithmetic Computation and Clerical Numbers as seen in Table XVII.

Discussion and Conclusions

The relationship between mental ability and school achievement has long been a matter of interest to educators and psychologists, many of whom believe that school achievement is a fairly reliable index of mental ability. As a matter of fact, it was on the basis of scores made on an English test that this class was divided into sections. Another point of view is that the mental ability score is highly predictive of school achievement.

A number of investigators have reported correlations between intelligence test scores and achievement test scores ranging from around .50 to .70. In one study by Gates[14] the average coefficient was .52. Also a number of studies have been made dealing with the relationship between intelligence test scores and specific achievement tests, such as reading and arithmetic. Loutitt[15] reports a median coefficient of correlation between intelligence test scores and reading of +.60.

In this study the coefficient between Mental Ability and Reading Comprehension scores is +.58. Scott[16] reports a coefficient of correlation of +.64 between intelligence test scores and addition and subtraction. In this study the coefficient of correlation between Mental Ability and Arithmetic Computation scores is +.62. Thus we see that the results of this study seem to be in line with the results of similar studies, showing that there is a definite relationship between mental ability and achievement test scores. However, it is scarcely high enough to warrant the statement that either one would be predictive of the other.

The relationship between mental ability and aptitudes as here measured and as shown in Table XV is less marked than the relationship between mental ability and achievement. All of the coefficients of correlation between mental ability and aptitudes fall below the fifty mark rather than above as was the case with the achievement tests. This may be caused in part by the nature of the aptitude tests which deal with rapid perception of form rather than with reasoning or memory of school material.

The low coefficient of .23 between the Mental Ability and Clerical Number test scores, and that of .33 between the Mental Ability and Paper Form Board tests scores suggest that we are measuring abilities that are only slightly measured by the Otis Mental Ability Test. The higher coefficient of +.48 between the Mental Ability and Clerical Names tests scores may be due to the fact that names occupy a much larger proportion of the pupils' attention and time in school than do numbers and form.

The coefficient of correlation between the Mental Ability Test and the Brown Personality Inventory is so low that one might say without question that there is no predictable relationship

14. A. I. Gates. "The Correlation of Achievement in School Subjects with Intelligence Tests," Journal of Educational Psychology, XII (October 1921), pp. 378-391

15. C. M. Loutitt. Clinical Psychology, Revised (New York: Harper & Brothers, 1947), p. 262.

16. Colin Scott. "An Eighth Grade Demonstration Class and the Three R's," Journal of Educational Psychology, X (April 1919), pp. 189-218.

between the two. The conclusion is that one could not give advice in regard to the selection of courses or a vocation on the basis of personality test results. Nevertheless, experience does point out that personality is a determining factor for success in many vocations, consequently, any data concerning a pupil's personality should be of considerable benefit in an educational or vocational guidance program.

Table XVI which presents the results of the intercorrelations of the four parts of the Coordinated Scales of Attainment shows the highest relationship to be between Reading Comprehension and Problem Reasoning. This might be expected as both involve the understanding of language. The coefficient of correlation is also relatively high between Arithmetic Computation and Problem Reasoning which one might expect because of the common use of figures. However, Davies[17] reported that almost no relationship exists between the two mathematical processes. A relatively high relationship occurs between Reading Comprehension and Arithmetic Computation which is not so easily explained. But since Table XV shows that the two highest correlations with Mental Ability scores were Reading Comprehension and Arithmetic Computation, it is possible that the mental ability factor is responsible for the high degree of relationship.

The relationship of the Language Arts to the two mathematical processes is lower than is Reading Comprehension, being +. 44 P. E. ±. 07 for Arithmetic Computation and +. 46 P. E. ±. 06 for Problem Reasoning. Evidently such factors as punctuation, grammar and capitalization play a relatively small part in the pupil's attack on practical problems.

The lowest intercorrelation of all in the Coordinated Scale of Attainment is that between Language Arts and Reading Comprehension, namely, +. 39 P. E. ±. 07. A correlation of this size shows that Language Arts do not function to any great degree in this group. A higher degree of proficiency in the Language Arts would no doubt be a great aid in reading comprehension, problem solving and other school subjects.

Table XVII presents intercorrelations between the aptitude test scores and correlations between the two parts of the Clerical Aptitude Test and two of the achievement test scores. The relationship between the two parts of the Clerical Aptitude Test—Numbers and Names—is low but significant (+. 40 P. E. ±. 07) and would seem to indicate that one might do fairly well in handling both numbers and names but the probability is not great. Also a low but significant correlation is shown between the Clerical Numbers and the Paper Form Board test scores (+. 37 P. E. ±. 07). But the low coefficient of +. 30 P. E. ±. 07 between Clerical Names and Paper Form Board tests scores indicates that we are dealing with unlike abilities, one verbal, the other pictorial in nature.

When we consider the relationship between Clerical Numbers and Arithmetic Computation, which would appear to deal with a common factor, namely, numbers, we find the coefficient is low (+. 37 P. E. ±. 07), but higher than the relationship between Mental Ability and Clerical Numbers tests scores which was +. 23 P. E. ±. 08, the lowest of the eight coefficients of correlation presented in Table XV. When we consider the relationship between the Clerical Names and Reading Comprehension, which might also be thought to deal with a common factor we find the coefficient much higher (+. 47 P. E. +. 07) and approximately equal to the correlation between Reading Comprehension and Mental Ability Tests scores.

The inference then may be that the Reading Comprehension and Mental Ability scores have about equal relationship to scores in the Clerical Names Aptitude Test. However, the coefficient is not high enough for one to say the aptitude test is measuring either reading comprehension or mental ability or that a reading comprehension or mental ability test would serve as a clerical aptitude test, even though there is a fair degree of correspondence between them.

From this study on correlations one might draw the following general conclusions: (1) There is a definite relationship between mental ability and school achievement, which finding is in keeping with that of previous investigations. (2) There is a relationship between the several school subjects investigated in this study. In other words, there is a tendency for a pupil to do generally all-round good or poor school work. This finding is confirmed by school records. (3) Apparently the aptitude tests tap abilities other than general mental ability. However, inasmuch as the set-up of the aptitude tests is different from that found in the other tests used it may be the lack of familiarity with the type of test itself. And (4) personality is a factor in its own right, so to speak. That is to say, it is less dependent upon mental ability than are school achievement and aptitudes such as those measured here.

General Conclusions

Since this study was undertaken to determine whether or not the abilities here measured would be helpful in the guidance of eighth grade pupils it is necessary to draw some general conclusions.

It is axiomatic that the level of mental devel-

17. G. R. Davies. "Elements of Arithmetic Ability," Journal of Educational Psychology, (1914), pp. 131-140.

opment and achievement set limits for success in certain types of work. Even though a certain degree of "passing" achievement is attained in spite of low mental ability, an individual is likely to be handicapped if he possesses little or no aptitude for the work upon which he embarks. Consequently, information concerning the pupil's mental ability, his academic achievement and his aptitudes would seem to be essential as a point of departure in guidance.

However, valuable as measures of mental ability, school achievement and aptitude may be, other factors are necessary for success in any undertaking. For example, aptitude tests of the type used in this study do not reveal whether the individual would be interested in clerical or mechanical jobs even though he might have the mental ability, aptitude and background for them. Or even assuming that he were interested, the tests fail to tell us how long that interest might last. Many studies reveal the fact that persons possessing high mental ability and aptitude for certain jobs lose interest in them if they are routine in nature. And on the other hand, persons having low mental ability but a fairly high degree of aptitude for a job quickly lose interest in it when placed in an environment where they are competing with others of a higher mental ability. Unfortunately, time did not permit the inclusion of an interest test in this battery. But knowledge concerning the pupil's interest would be necessary for a guidance officer. In the absence of such the results from other tests may be used as indirect clues to the pupil's interest.

Another factor which has considerable weight in judging a person as fit or unfit for a particular job is his personality. For example, such factors as whether a person prefers working alone or with others, whether he likes outdoor or indoor work, whether he finds the people with whom he is to work congenial or not are important personality traits to consider before guiding him into a certain kind of work.

Other contributing factors that were not investigated in this study, but which would be of great importance would be the presence of organic defects, habits of work and previous expe ience.

Thus, when a guidance officer knows that a pupil has good mental ability and has the personality to achieve results in keeping with his intellectual potentiality, he opens the doors for him to follow his interest and special aptitudes, if any. Then the guidance officer need only bid him "God speed" in his chosen field with the assurance that he will meet with success, barring accidents. But the pupil with high mental potentiality, but lacking the personality to achieve in keeping with his ability needs very careful guidance and help. For those with relatively low mental endowment but who have aspirations or interests either not in keeping with their ability or their personality, great care is needed to guide them into fields of work where their achievements will bring them success and personal satisfaction.

Useful as test results may be no guidance officer would rely upon them exclusively, because every measure must be considered merely as a measure at a certain time and under certain conditions with testing instruments far from perfect. And in the case of young people one must not fail to consider the possibility of sudden changes occuring, sometimes due to internal changes which accompany physical development, and sometimes due to external changes in his social world over which he has no control, such as war or physical disaster. Consequently, a guidance program would necessarily not be a once and for all time affair, but would have to be fluid, flexible and continuous.

A STUDY OF THE EXTENT OF ASSOCIATION OF CERTAIN PROFESSIONAL AND PERSONAL DATA WITH JUDGED EFFECTIVENESS OF TEACHER BEHAVIOR*

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Problem

The purpose of this study was to investigate certain factors or conditions that might be related to effective teaching at the elementary school level and to estimate the extent to which measures of such conditions were associated with judgments of teaching effectiveness made by trained observers.

Various hypotheses may be advanced regarding sets of conditions that either (1) operate as selective devices, or (2) tend to affect directly the typical behavior patterns of teachers. For example, differences in policies and practices among school systems might be expected to attract certain kinds of teachers to specified systems to the exclusion of others. Or, teaching experience might reasonably be expected to leave its mark on a teacher, influencing directly her classroom performance.

The Teacher Characteristics Study has attempted to test a number of such hypotheses. The results to be reported here have to do with elementary teachers who had been classified, first, according to effectiveness of classroom performance as judged by trained observers, and second, with respect to such professional and personal data as:

(1) school system in which teacher was employed
(2) socio-economic status of the neighborhood in which the school served by teacher was located
(3) amount of college training of teacher
(4) amount of teaching experience of teacher
(5) marital status of teacher
(6) score of teacher on each of seven dimensions measured by the Thurstone Temperament Schedule (Active, Vigorous or Masculine, Impulsive, Dominant, Stable, Sociable, and Reflective)
(7) extent of teacher's agreement with her principal on responses to the Educational Viewpoint Inquiry

Subjects

The subjects participating in this phase of the Teacher Characteristics Study were 275 women third and fourth grade teachers. The sample included all third and fourth grade teachers in four different communities.

The communities ranged from 50,000 to approximately 100,000 population each and were from the same geographic area. Teacher salaries varied, but all school systems represented were "above average" in this respect. The school systems differed in avowed "philosophy of education".

Neighborhoods served by the various school buildings where the teachers were employed represented a considerable range from the standpoint of socio-economic status.

The teachers varied widely with regard to age, amount and kind of training, extent of teaching experience, score on areas of personality measured by the Thurstone Temperament Schedule, and other factors.

Sources of Basic Data

Each teacher participating in the study was asked to complete a number of inventories and checklists which provided information of a biographical nature and also data relative to the teacher's activities, interests, preferences, opinions, and viewpoints.

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TABLE I

COMPARISON OF MEAN CRITERION SCORES[a] OF TEACHERS CLASSIFIED BY SCHOOL SYSTEM (P, S, B, G)[b] IN WHICH EMPLOYED

	Criterion					
	A	B	C	D	Total	P
Mean P	51.22	50.72	49.80	49.71	50.38	48.93
Mean S	48.98	49.00	50.25	50.10	49.54	49.12
Difference	2.24	1.72	.45	.39	.84	.19
$\sigma_{(M_P-M_S)}$	1.44	1.63	1.52	1.47	1.33	1.54
Significant Level of Difference	*	*	*	*	*	*
Mean P	51.22	50.72	49.80	49.71	50.38	48.93
Mean B	50.64	49.58	50.84	50.04	50.23	50.17
Difference	.58	1.14	1.04	.33	.15	1.24
$\sigma_{(M_P-M_B)}$	1.44	1.42	1.39	1.43	1.24	1.35
Significant Level of Difference	*	*	*	*	*	*
Mean P	51.22	50.72	49.80	49.71	50.38	48.93
Mean G	48.34	50.45	48.85	50.29	49.56	50.84
Difference	2.88	.27	.95	.58	.82	1.91
$\sigma_{(M_P-M_G)}$	1.37	1.37	1.37	1.36	1.18	1.28
Significant Level of Difference	5%	*	*	*	*	*
Mean S	48.98	49.00	50.25	50.10	49.54	49.12
Mean B	50.64	49.58	50.84	50.04	50.23	50.17
Difference	1.66	.58	.59	.06	.69	1.05
$\sigma_{(M_S-M_B)}$	1.29	1.38	1.29	1.24	1.13	1.45
Significant Level of Difference	*	*	*	*	*	*
Mean S	48.98	49.00	50.25	50.10	49.54	49.12
Mean G	48.34	50.45	48.85	50.29	49.56	50.84
Difference	.64	1.45	1.40	.19	.02	1.72
$\sigma_{(M_S-M_G)}$	1.20	1.33	1.28	1.15	1.06	1.38
Significant Level of Difference	*	*	*	*	*	*
Mean B	50.64	49.58	50.84	50.04	50.23	50.17
Mean G	48.34	50.45	48.85	50.29	49.56	50.84
Difference	2.30	.87	1.99	.25	.67	.67
$\sigma_{(M_B-M_G)}$	1.21	1.05	1.12	1.10	.95	1.17
Significant Level of Difference	*	*	*	*	*	*

[a]Normalized standard scores, $M = 50$, $\sigma = 10$.

[b]$N_P = 85$; $N_S = 48$; $N_B = 69$; $N_G = 73$.

*Significance levels not computed if $P > .05$.

TABLE II

COMPARISON OF MEAN CRITERION SCORES[a] OF TEACHERS CLASSIFIED BY SOCIO-ECONOMIC STATUS OF COMMUNITY[b] IN WHICH SCHOOL IS LOCATED

	Criterion					
	A	B	C	D	Total	P
Mean Group 1	49.88	50.62	48.70	48.95	49.55	49.95
Mean Group 2	50.00	49.93	49.97	50.12	50.02	49.75
Difference	.12	.69	1.27	1.17	.47	.20
$\sigma(M_1-M_2)$	1.32	1.21	1.34	1.32	1.06	1.12
Significant Level of Difference	*	*	*	*	*	*
Mean Group 1	49.88	50.62	48.70	48.95	49.55	49.95
Mean Group 3	49.26	50.30	51.22	50.91	50.30	49.83
Difference	.62	.32	2.52	1.96	.75	.12
$\sigma(M_1-M_3)$	1.96	1.78	1.91	1.87	1.50	1.86
Significant Level of Difference	*	*	*	*	*	*
Mean Group 2	50.00	49.93	49.97	50.12	50.02	49.75
Mean Group 3	49.26	50.30	51.22	50.91	50.30	49.83
Difference	.74	.37	1.25	.79	.28	.08
$\sigma(M_2-M_3)$	1.67	1.56	1.57	1.55	1.35	1.69
Significant Level of Difference	*	*	*	*	*	*

[a]Normalized standard scores, M = 50; σ = 10.

[b]A seven category scale for the rating of socio-economic status of communities was developed by a modified paired-comparison technique. For the comparisons of teachers presented here, the seven point scale was collapsed to provide three groupings of school communities:
Group 1—Above average (ratings of 6 or 7), Teacher N = 40
Group 2—Average (ratings of 3, 4, or 5), Teacher N = 212
Group 3—Below average (ratings of 1 or 2), Teacher N = 23

*Significance levels not computed if $P > .05$.

Information having to do with the college training, teaching experience, and marital status of the teacher were provided by the Teacher Characteristics Study's Biographical and Activity Checklist.

The teacher's relative position on each of seven personality dimensions was obtained through use of a relatively new questionnaire, the Thurstone Temperament Schedule. The areas covered by the schedule are described as follows:[1]

Active. A person scoring high in this area usually works and moves rapidly. He is restless whenever he has to be quiet. He likes to be "on the go" and tends to hurry.

Vigorous. This area emphasizes physical activity using large muscle groups and great expenditure of energy such as in physical sports and outdoor occupations. (This trait is often described as "masculine", but many women and girls score high in the area.)

Impulsive. A high score in this category indicates a person who makes decisions quickly, enjoys competition, and changes easily from one task to another. The decision to act or change is quick regardless of whether the person moves slowly or rapidly, or enjoys or dislikes strenuous projects.

Dominant. People scoring high on this factor think of themselves as leaders, capable of taking initiative and responsibility. They are not domineering. They enjoy public speaking, organizing social activities, promoting projects, and persuading others.

Stable. Persons who have high scores in this area are emotionally stable. They usually are cheerful and have an excellent disposition. They can relax in a noisy room, and they remain calm in a crisis.

Sociable. Persons with high scores in this area enjoy the company of others, make friends easily, and are sympathetic, cooperative, and agreeable in their relations with people.

Reflective. High scores in this area indicate that a person likes meditative and reflective thinking and enjoys dealing with theoretical rather than practical problems. Persons scoring high in this area are usually quiet, work alone, and enjoy work that requires accuracy and fine detail.

A measure of the correspondence between a teacher's educational viewpoints and those of her school principal was obtained by having the Educational Viewpoints Inquiry[2] completed by both teacher and principal and determining the number of responses upon which there was agreement.

The relative socio-economic status of the neighborhood served by the school in which a teacher was employed was obtained through the use of a seven division rating scale which had been developed by the Teacher Characteristics Study.[3]

The criterion data (i.e., estimates of teaching effectiveness) were derived from assessments made by trained observers[4] and recorded on the specially devised Classroom Observation Blank. This Blank covered (a) 20 dimensions relating to directly observable teacher behavior (e.g., Partial - Fair), and (b) six dimensions referring to pupil behavior (e.g., Restrained - Participating),

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1. L. L. Thurstone. Examiner Manual for the Thurstone Temperament Schedule (Chicago: Science Research Associates, 1950).

2. The Educational Viewpoints Inquiry was developed for the purpose of estimating a teacher's "viewpoints" or "philosophy" with respect to various educational issues. The Inquiry (Elementary School Form) consisted of twenty items referring to questions involving "curricular organization and scope", "pupil participation (in class planning and control)", "pupil achievement standards", "teacher-administrative responsibility", and "parent participation in the school program." A forced-choice type of question was employed, permitting the respondents no middle-of-the-road answers. The following item illustrates those included in the Inquiry:

   Do you believe that third grade children should
   ☐ be required to meet prescribed academic standards before beginning the work of the fourth grade?
   ☐ not be required to meet minimum standards of academic achievement before beginning fourth grade work?

3. The socio-economic rating scale was developed by a modification of the paired-comparison technique. In the final form of the scale, each of the seven divisions was described in terms of a particular known neighborhood. The neighbor-

TABLE III

COMPARISON OF MEAN CRITERION SCORES[a] OF TEACHERS CLASSIFIED BY AMOUNT OF COLLEGE TRAINING[b]

	Criterion					
	A	B	C	D	Total	P
Mean Group 1	50.45	50.45	50.23	51.27	50.95	49.96
Mean Group 2	49.71	50.06	49.76	49.50	49.79	49.91
Difference	.74	.39	.47	1.77	1.16	.05
$\sigma_{(M_1-M_2)}$	1.28	1.28	1.27	1.29	1.12	1.24
Significant Level of Difference	*	*	*	*	*	*
Mean Group 1	50.45	50.45	50.23	51.27	50.95	49.96
Mean Group 3	50.44	50.11	50.00	50.00	50.11	50.00
Difference	.01	.34	.23	1.27	.84	.04
$\sigma_{(M_1-M_3)}$	2.09	1.90	1.98	2.25	1.64	2.15
Significant Level of Difference	*	*	*	*	*	*
Mean Group 2	49.71	50.06	49.76	49.50	49.79	49.91
Mean Group 3	50.44	50.11	50.00	50.00	50.11	50.00
Difference	.73	.05	.24	.50	.32	.09
$\sigma_{(M_2-M_3)}$	2.09	1.87	1.95	2.21	1.64	2.34
Significant Level of Difference	*	*	*	*	*	*

[a]Normalized standard scores, M = 50; σ = 10.

[b]Group 1—Less than 4 years college, N = 75
Group 2—4-5 years college, N = 107
Group 3—6 or more years college, N = 9

*Significante levels not computed if P >. 05.

TABLE IV

COMPARISON OF MEAN CRITERION SCORES[a] OF TEACHERS CLASSIFIED BY EXTENT OF TEACHING EXPERIENCE[b]

	Criterion					
	A	B	C	D	Total	P
Mean Group 2	50.17	47.17	49.35	49.27	48.97	48.15
Mean Group 3	54.59	52.88	54.47	52.84	53.72	52.56
Difference	4.42	5.71	5.12	3.57	4.75	4.41
$\sigma_{(M_2-M_3)}$	2.00	1.86	1.96	1.80	1.73	2.03
Significant Level of Difference	5%	1%	1%	5%	1%	5%
Mean Group 2	50.17	47.17	49.35	49.27	48.97	48.15
Mean Group 4	49.03	51.65	49.59	50.47	50.22	50.49
Difference	1.14	4.48	.24	1.20	1.25	2.34
$\sigma_{(M_2-M_4)}$	1.22	1.33	1.30	1.33	1.16	1.26
Significant Level of Difference	*	1%	*	*	*	*
Mean Group 3	54.59	52.88	54.47	52.84	53.72	52.56
Mean Group 4	49.03	51.65	49.59	50.47	50.22	50.49
Difference	5.56	1.23	4.88	2.37	3.50	2.07
$\sigma_{(M_3-M_4)}$	1.93	1.64	1.79	1.63	1.57	1.86
Significant Level of Difference	1%	*	1%	*	5%	*

[a]Normalized standard scores, M = 50; σ = 10.

[b]Group 1—Less than 1 year experience, N = 4 (Means not computed)
Group 2—1-4 years experience, N = 60
Group 3—5-9 years experience, N = 32
Group 4—10 or more years experience, N = 111

*Significance level not computed if P > .05.

TABLE V

COMPARISON OF MEAN CRITERION SCORES[a] OF TEACHERS CLASSIFIED BY MARITAL STATUS[b]

	Criterion					
	A	B	C	D	Total	P
Mean S	50.09	50.75	49.90	49.62	50.12	50.32
Mean M	50.30	49.70	50.26	51.11	50.35	49.54
Difference	.21	1.05	.36	1.49	.23	.78
$\sigma_{(M_S-M_M)}$	1.18	1.16	1.15	1.17	1.02	1.13
Significant Level of Difference	*	*	*	*	*	*

[a]Normalized standard scores, M = 50, σ = 10.

[b]Group S—Single teachers (including divorced and widowed), N = 99
Group M—Married teachers, N = 107

*Significance level not computed if P > .05.

from which teacher behavior might be inferred. A four-point scale was employed. Each dimension was further described and delimited in terms of specific behaviors, and synonyms, in a glossary which accompanied the Observation Blank.

Each of the participating teachers was observed on different occasions by three, and in one community four, of the observers. All observations and assessments were independently made.

When the observations were completed, the data of the several observers were combined to provide a composite assessment for each teacher on each dimension of the Classroom Observation Blank. Product moment correlation coefficients were computed between the dimensions, and the resulting table of intercorrelations was factor-analyzed by the centroid method and both orthogonal and oblique rotations attempted. Five oblique factors resulted: Factor A, which appeared to refer to (1) pupil participation, and (2) open-mindedness (originality, adaptability, and tolerance) on the part of the teacher; Factor B, which seemed to relate to (1) controlled pupil activity, and (2) a business-like approach on the part of the teacher; Factor C, which seemed to describe the teacher who (1) was liked by others for such "human" traits as understanding and impartiality, and (2) tended to be calm and consistent; Factor D, which appeared to refer to teacher sociability (the social environment consisting of eight to ten year old children in this case); and Factor E, which seemed to relate to the superficial appearance or attractiveness of the teacher.

The criteria of "effectiveness of teacher behavior" against which the several hypotheses were tested were derived largely from the results of the above described factor analysis. A raw score on Criterion A was obtained for each teacher for each observation by scoring the teacher's assessments (on the Classroom Observation Blank) which had high factor loadings on Factor A. The distribution of raw factor scores was normalized for each observer and these normalized factor scores combined to provide a criterion score on Criterion A for each teacher. In a similar manner a criterion score was obtained for each teacher for Criterion B, C, and D.

Factor E, referring to attractiveness as revealed through the teacher's physique, voice, and expressive movements, was not scored to yield criterion data.

A "Total" criterion score was obtained for each teacher by summating the teacher's criterion scores on A, B, C, and D.

One additional criterion score, Criterion P, was obtained by a separate scoring of the Classroom Observation Blank for each teacher with regard only to the six "pupil behavior" dimensions.

Procedure

The procedure followed in this study was: (1) to classify the subjects with respect to a particular set of data (e.g., amount of teaching experience) and then determine the statistical significance of the difference between the mean scores of the classified groups on each criterion (e.g., Criterion A, B, C, D, Total, or P); or (2) in the case of the temperament data to select the upper 27% (Group H) and the lower 27% (Group L) of the subjects on a particular criterion and then determine the statistical significance of the difference between the mean scores of the criterion Group H and the criterion Group L on the personality dimension under consideration.

Results

The findings growing out of this study are shown in Tables I through VIII.

It will be noted from Table I that there was only one statistically significant difference between the teachers classified by school system in which employed. This difference, between systems G and P on Criterion A (open-minded teacher, good pupil participation) was significant at the 5% level. Apparently in the communities studied there were few selective factors operating to attract better teachers to one community than to another.

When the teachers were classified by the socio-economic status of the neighborhood in which their school was located, the differences were all small and in sixteen of the eighteen comparisons the standard error of the difference exceeded the mean difference. The closest approach to a significant difference was that between the means of teachers in above-average and below-average communities on Criterion C (human, calm). For these communities it would appear that the kind of neighborhood from which the pupils were drawn did not greatly affect teaching performance at the third and fourth grade level.

Comparisons of the teachers by amount of college training, Table III, yielded only small differences, none of which was significant at the 5%

hood in which a school was located was assigned a rating by matching it with a neighborhood described by one of the divisions of the scale.

4. The observers were intensively trained over a period of five weeks in observing teacher behavior and in assessing the behavior observed by recording their observations on the Classroom Observation Blank.

TABLE VI

COMPARISON OF MEAN SCORES OF CRITERION GROUPS OF TEACHERS[a] ON DIMENSIONS MEASURED BY THE THURSTONE TEMPERAMENT SCHEDULE

	Criterion					
	A	B	C	D	Total	P
Active						
Mean Group H	10.42	10.38	10.37	10.50	10.38	10.25
Mean Group L	10.81	11.23	10.80	10.55	10.78	10.90
Difference	.39	.85	.43	.05	.40	.65
$\sigma_{(M_H-M_L)}$	.68	.73	.70	.71	.64	.71
Signif. Level of Difference	*	*	*	*	*	*
Vigorous						
Mean Group H	8.44	8.38	7.80	8.17	8.07	8.33
Mean Group L	6.91	7.77	7.41	7.74	7.31	7.33
Difference	1.53	.61	.39	.43	.76	1.00
$\sigma_{(M_H-M_L)}$	.71	.75	.79	.75	.67	.73
Signif. Level of Difference	5%	*	*	*	*	*
Impulsive						
Mean Group H	11.35	10.98	10.92	11.27	10.95	11.15
Mean Group L	10.05	9.90	9.90	9.83	9.88	9.88
Difference	1.30	1.08	1.02	1.44	1.07	1.27
$\sigma_{(M_H-M_L)}$	.67	.77	.73	.65	.66	.69
Signif. Level of Diff.	(almost 5%)	*	*	5%	* (almost 5%)	
Dominant						
Mean Group H	11.83	10.44	10.65	10.90	10.82	10.95
Mean Group L	8.53	9.41	9.07	8.00	8.33	8.24
Difference	3.30	1.03	1.58	2.90	2.49	2.71
$\sigma_{(M_H-M_L)}$	1.00	1.03	1.04	.98	.94	.99
Signif. Level of Difference	1%	*	*	1%	1%	1%
Stable						
Mean Group H	11.94	11.52	11.84	11.19	11.50	11.67
Mean Group L	11.37	11.49	11.10	10.71	11.20	11.43
Difference	.57	.03	.74	.48	.30	.24
$\sigma_{(M_H-M_L)}$	.81	.82	.86	.83	.77	.76
Signif. Level of Difference	*	*	*	*	*	*

TABLE VI (Continued)

	Criterion					
	A	B	C	D	Total	P
Sociable						
Mean Group H	14.42	13.38	13.53	13.94	13.60	13.78
Mean Group L	12.44	13.03	12.44	11.95	12.37	11.98
Difference	1.98	.35	1.09	1.99	1.23	1.80
$\sigma_{(M_H-M_L)}$	.77	.82	.83	.79	.75	.82
Signif. Level of Difference	5%	*	*	5%	*	5%
Reflective						
Mean Group H	9.60	9.69	9.76	9.90	9.77	9.89
Mean Group L	9.86	9.13	10.17	9.62	9.71	9.24
Difference	.26	.56	.41	.28	.06	.65
$\sigma_{(M_H-M_L)}$	.62	.68	.66	.65	.60	.66
Signif. Level of Difference	*	*	*	*	*	*

[a]The criterion groups varied in size according to the criterion factor considered:

Criterion A—$N_H = 52$, $N_L = 43$
" B—$N_H = 52$, $N_L = 39$
" C—$N_H = 51$, $N_L = 41$
" D—$N_H = 48$, $N_L = 42$
" T—$N_H = 60$, $N_L = 49$
" P—$N_H = 55$, $N_L = 42$

*Significance levels not computed if $P > .05$.

TABLE VII

COMPARISON OF MEAN CRITERION SCORES[a] OF TEACHERS CLASSIFIED[b] BY AGREEMENT OF RESPONSES OF TEACHER TO RESPONSES OF PRINCIPAL ON AN EDUCATIONAL VIEWPOINTS INQUIRY

	Criterion					
	A	B	C	D	Total	P
Mean Group 1	50.78	49.85	50.71	50.93	50.54	50.02
Mean Group 2	49.98	49.98	49.10	48.73	49.46	49.29
Difference	.80	.13	1.61	2.20	1.08	.73
$\sigma_{(M_1-M_2)}$	1.91	1.82	1.87	1.80	1.63	1.83
Significant Level of Difference	*	*	*	*	*	*

[a]Normalized standard scores, M = 50, σ = 10.

[b]Group 1—Upper 27%, N = 41
Group 2—Lower 27%, N = 41

*Significance level not computed if P > .05.

TABLE VIII

MEAN SQUARE CONTINGENCY COEFFICIENTS BETWEEN DATA FREQUENTLY EMPLOYED IN TEACHER DESCRIPTIONS

			N	C	$1/\sqrt{n}$
Pupil Behavior	vs.	Teacher Experience	203	.21	.07
Pupil Behavior	vs.	Socio-Economic Status of Community	275	.11	.06
Pupil Behavior	vs.	Marital Status of Teacher	206	.11	.07
Pupil Behavior	vs.	Amount of Training of Teacher	191	.11	.07
Pupil Behavior	vs.	Agreement of Teacher with Principal on Educational Viewpoints	82	.08	.11
Teacher Experience	vs.	Agreement of Teacher with Principal on Educational Viewpoints	78	.09	.11

level or beyond.

Amount of teaching experience did seem to be a factor of some importance as may be noted from Table IV. There was a tendency for teachers with 5-9 years of experience to be significantly higher with respect to criterion scores than teachers with lesser or greater amounts of experience. The 5-9 year experience group was superior to the 1-4 year experience group on all criteria and this group also was superior to the 10 or more year group on Criterion A (pupil participation, open-minded teacher), Criterion C (human, calm) and Criterion T (total). The 1-4 year experience group and the 10 or more year group did not seem to differ greatly except on Criterion B (business-like teacher, controlled pupil activity). A curvilinear relationship between experience and effectiveness of teaching frequently has been hypothesized, and would appear to be supported by the data here presented.

Table V revealed no significant difference between the groups of single and married teachers on any of the criteria. The closest approach to a difference that might be meaningful was one in favor of the married teacher group on Criterion D, the sociability factor.

The results of the analysis of the Thurstone Temperament Schedule scores of high (upper 27%) and low (lower 27%) criterion groups are shown in Table VI. With regard to Criterion A (open-minded teacher, pupil participation) the high group scored significantly higher than the low group on four dimensions, Dominant, Sociable, Vigorous, and Impulsive. None of the differences between temperament dimension scores of high and low groups on Criterion B or C was significant. The mean dimension scores of the Criterion D high group were significantly greater than those of the Criterion D low group on three dimensions, Dominant, Sociable, and Impulsive. For Criterion T (Total) the high group scored significantly higher than the low group on the Dominant dimension. High and low groups on Criterion P were differentiated by three dimensions, Dominant, Sociable, and Impulsive. It would appear that certain temperament traits measured by the Thurstone Temperament Schedule are possessed to significantly greater degrees by high as compared to low groups on certain of the criteria here employed.

Table VII provides an interesting comparison, since it has been suggested that the school atmosphere, as determined by the educational philosophy or viewpoint, affects the effectiveness of teacher performance. To test this hypothesis the educational viewpoints of teachers and their respective principals were compared. For the teachers and principals included in this sample, there was no apparent relationship between the extent to which a teacher agreed with her principal in educational viewpoints and the effectiveness of the teacher's performance.

In Table VIII are presented several mean square contingency coefficients between data frequently employed in teacher descriptions. This table is self-explanatory. None of the coefficients is high enough to attach importance to it.

Concluding Statement

Of the several kinds of data analyzed in this study and for the described sample, amount of teaching experience and certain temperament traits appear to be most significantly associated with the criteria of teaching effectiveness employed by the Teacher Characteristics Study (factor scores derived from the judgments of trained observers).

DETERMING CRITICAL REQUIREMENTS FOR TEACHERS*

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One of the perplexing problems confronting education is how to identify and define the qualities or traits (abilities, attitudes, etc.,) which contribute to teaching competence.

The school administrator frequently is called upon to judge teachers with respect to their teaching effectiveness, a judgment that may play an important role in determining the teachers' success or failure in present and future teaching positions. Yet there is little common understanding regarding the definition of teaching effectiveness or ineffectiveness. Educators differ widely in their viewpoints and biases, and it is not uncommon for one supervisor or principal to judge a particular teacher-quality desirable while another thinks of the same trait as an undesirable teacher characteristic.

With the need for a better understanding of the patterns of personality traits and classroom behaviors of teachers in mind, the staff of the Teacher Characteristics Study has attempted a thorough-going canvass of available information dealing with effective and ineffective teaching. It was hoped that from such study a more clear-cut definition of "good" and "poor" teaching might emerge.

A number of sources were utilized in seeking a definition of criterion behavior with respect to teaching. One such source, and a particularly useful one in that it yielded empirical data, was the report of specific examples of teacher behavior provided by persons actively engaged in teaching or preparation for teaching. The procedure, as developed and utilized during the past five years by the American Institute of Research, is commonly referred to as the critical incidents technique.[1]

The staff of the Teacher Characteristics Study feels that the approach, while not giving a final answer to the question of "What is a good teacher like?" provides important confirming information in defining effective and ineffective teaching. It is suggested that the method might be a useful one in local school situations where the problems of teaching and their evaluation are being realistically faced.

The present report has been prepared with the intention of providing an illustration of the application of the critical incidents technique to teaching—an illustration which may serve as a guide, modified as may seem desirable, to the study of the problem in local school systems or districts.

General Approach

The procedure employed in this study of the classroom behavior of teachers is based upon suggestions reported by Dr. John C. Flanagan and his co-workers at the American Institute of Research, who have explored the use of critical incidents particularly in industrial research.

The technique as used in the Teacher Characteristics Study consisted of collecting analytical reports of especially effective or ineffective classroom behaviors of teachers, from individuals who were closely associated and well acquainted with the teaching process, i.e., supervisors, training-teachers, students in methods-of-teaching courses, public school teachers, student practice-teachers, and school principals. These reports of critical incidents in teaching supplied the detailed data from which a list of critical requirements was developed. (A critical requirement, as the term is used here, refers to any observable teacher behavior or activity that may make the difference between success and failure in teaching.)

The approach intentionally omits those aspects of teaching which appear to be carried out in an acceptable manner by practically all teachers.

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*This paper describes one of the approaches employed by the Teacher Characteristics Study in attempting to define criteria of teaching effectiveness. The Teacher Characteristics Study is subsidized by The Grant Foundation and sponsored by the American Council on Education.

1. For a more complete description of the critical incident technique, see: John C. Flanagan, Critical Requirements for Research Personnel (Pittsburgh: American Institute for Research, 1949); and "The Critical-Requirements Approach to Educational Objectives," School and Society, (May 1950), pp. 321-324.

It includes only those behaviors that seem to differentiate effective teachers from ineffective teachers. The procedure is unique in that it deviates from the common practice of referring to effectiveness or ineffectiveness in abstract terms or with broad generalizations; critical requirements are described in terms of specific observable behaviors.

Collection of Data

The respondents contributing critical incidents in this study were teachers, administrators, and teachers-in-training. All were residents of the Los Angeles area. No serious attempt was made to obtain a representative sample of teachers or teachers-in-training, although the desirability of such a step is obvious.

Following a careful explanation of the procedure, the respondents were asked to write detailed descriptions of critical incidents of teaching. The descriptions were written in specially prepared booklets and each was accompanied by control data relative to the teacher described.

Prior to the writing of the descriptions of teacher behavior, certain criteria of usable critical incidents were explained so that directional specificity could be assured.

It was pointed out that a critical incident should not be (1) a description listing generalized traits or abstractions; (2) a report unduly affected by behavior that is merely personally irritating or annoying to the reporter; (3) the result of a judgment based on stereotyped ideas of what is effective or ineffective rather than on what the reporter really thinks; (4) a report based on behavior selected only because of its dramatic qualities.

On the positive side, it was explained that a critical incident must (1) be an accurate, detailed description of behavior; (2) be an objective, unbiased description of behavior; (3) describe behavior observed in a specific situation; (4) describe behavior that the reporter believes to be either clearly effective or clearly ineffective.

It was emphasized that a critical incident should describe what some teacher did in a specific situation at a specific time—something the teacher did that seemed markedly effective or ineffective.

The participants were then asked to respond to six situations or questions, each printed on a separate page of the booklet. The six sets of directions read as follows:

1. Think of the elementary or high school teachers with whom you have been closely associated recently. Of those teachers, think of the one teacher you consider most ineffective. The teacher you are thinking of probably did a lot of things which caused you to feel that he or she was ineffective, but what was the final incident that influenced you? Describe the situation and just what the teacher did that convinced you of his ineffectiveness on the job. What behavior demonstrated the teacher's ineffectiveness?

2. Think of the one most effective elementary or high school teacher with whom you have been closely associated recently. The person you have in mind probably did many things that convinced you he or she was effective, but what was the most recent thing that he did which was outstanding and made you consider him especially effective. Describe some specific thing that he did that makes him stand out in your mind as being particularly effective on the job.

3. Think over the past month or two and recall the last time you observed a teacher in elementary or high school do something especially ineffective—(it need not have been done by a generally ineffective person). Just what was done on that particular occasion? What was the act? What did he do? Be specific, and avoid inferences.

4. Think over the last month or two and recall the last time you observed any teacher do something especially effective. Just what was done on that particular occasion? What was the act? What did the teacher do? Be specific, and avoid inferences.

5. Think back about the teachers you had when in elementary school and high school. Try to think of the most ineffective teacher you had. Now try to recall specific incident that stands out in your memory as an illustration of the ineffectiveness of this teacher. What was the situation? What did the teacher do?

6. Think back about the teachers you had when in elementary and high school. These are the teachers who taught the classes you attended when you were in school. Try to think of the most effective teacher you had. Now try to recall a specific incident that stands out in your memory as an illustration of the effectiveness of this teacher. What was the situation? What did the teacher do?

Approximately 500 incidents were reviewed. After some 200 incidents each of effective and ineffective behavior had been analyzed, few new types of behavior were noted.

The distribution among educational groups of the 144 contributors of critical incidents, is shown in Table I.

TABLE I

IDENTITY OF CONTRIBUTORS OF CRITICAL INCIDENTS* DESCRIBING TEACHING BEHAVIORS

Group	No. of Contributors			No. of Incidents* Reported	Av. No. Incidents Reported per Contributor
	Male	Female	Total		
Students in Methods of Teaching Courses	34	36	70	326	4.66
Supervisors and Training Teachers	13	15	28	75	2.68
Public School Teachers	10	18	28	55	1.96
Student Practice Teachers	7	3	10	30	3.00
School Principals	5	3	8	20	2.50
Totals	69	75	144	506	3.51

*Includes only those incidents that satisfied the criteria of a "useable" critical incident.

Preparation of the Data

The reports submitted were first reviewed to determine whether each incident reported met the criteria for a good or usable critical incident. Then, each example of a specific, objective description of teacher behavior was summarily transcribed to a separate five by eight inch record card. Each record card (illustrated in Fig. 1) carried the following data:

(a) Identifying information: identification number and educational group classification of the reporter; sex, approximate age, and grade level or subjects taught by the teacher described.

(b) Summary statement of the specific teacher behavior reported.

(c) Summary description of the situation in which the behavior occurred.

(d) Identification of the behavior as effective or ineffective.

If several incidents were described in a single report, each was recorded on a separate card as a separate incident.

A description submitted by one student-teacher, and the transcription as it appeared on the record card, are shown on the next page.

Category Formulation

Following the transcribing of critical incidents to separate cards, the cards were sorted and the incidents classified. Similar behaviors were grouped together and description of the several resulting categories attempted. This procedure was carried out in several steps, which included: (1) identification of the salient features in each teacher behavior reported; (2) derivation of a rough classification scheme to facilitate ordering of the data; (3) classification of each critical behavior under one of the categories set up in the previous step; (4) preparation of a descriptive statement covering each category of behavior; (5) refinement of the categories, and preparation of a generalized descriptive statement for each.

Identification of Salient Features—As noted above, the salient features of the behavior comprising an "incident" were summarized in the space under Specific Behavior on the Critical Incident Record Card. Needless to say, extreme care was observed in preparing these summaries, every effort being made to assure accuracy and objectivity. Additional data relative to the setting of an incident and statements regarded as inferences were separated from essential teacher behavior and separately recorded on the card.

Derivation of Classification Scheme—The derivation of the classification system to be followed was a step of major importance. A number of possible designs was explored. In view of the nature of the Teacher Characteristics Study, it was decided that the categories employed should take account especially of qualities having to do with the teacher's classroom behavior and particularly with her effectiveness in maintaining effective relationships with pupils. Following a preliminary review and frequency count of the incidents reported (and after consultation with the project staff of the Teacher Characteristic Study[2]) three major categories considered to be relatively non-overlapping and distinct in concept were tentatively chosen. Once the tentative major categories had been set up and defined, a preliminary classification of the summarized incidents was undertaken. The need for sub-areas to group similar behaviors within the major areas soon became apparent. A number of sub-categories therefore were established. Thus, the several classes or areas were developed almost entirely on an inductive basis, the incidents in each area being carefully read and re-read, and the cards sorted into piles according to basic similarities in the behaviors. The major categories and sub-categories emerging at this stage are shown below:

1. Personal Qualities Reflected by Reported Incidents
   - a. Optimism — Pessimism
   - b. Fairness — Partiality
   - c. Self-control — Impatience

2. Professional Qualities Reflected by Reported Incidents
   - a. Knowledge of subject taught and techniques of teaching — Lack of knowledge of subject and techniques
   - b. Ability to get student response — Lack of ability to get student response
   - c. Business-like approach — Disorganized and ineffecient approach

3. Social Qualities Reflected by Reported Incidents

2. Approximately 1500 observations were made (by trained observers) of some 500 elementary and high school teachers in connection with the Teacher Characteristics Study.

Critical Incident Submitted by a Student-Teacher

The teacher told the girls in a clothing class to buy their materials and patterns to make their first garment, before giving the proper demonstration of taking body measurements, in order to determine the size pattern to buy. The girls were utterly confused because their patterns didn't fit them and in some instances the material was ruined because there wasn't sufficient amount to get the garment cut out properly. One girl remarked to the teacher, "My mother is going to be mad if the skirt doesn't fit and the material is ruined." The teacher answered, sarcastically, "Well, if it does not fit, it won't be my fault. You should have learned how to take body measurements in the fifth grade. You will just have to buy more material and rectify your own mistake."

1	45	M (F)	10th clothing class	E (I)	TT T PT Sup Ad (St)		
No.	Age	Sex	Grade/Sub.	Quality	Reporter		

SPECIFIC BEHAVIOR (INCIDENT):

One girl remarked, "My mother will be mad if my skirt doesn't fit and the material is ruined." The teacher answered, "Well, if it doesn't fit, it won't be my fault. You should have learned how to take body measurements in the fifth grade. You will just have to buy more material and rectify your own mistake."

SITUATION	REPORTER'S INFERENCES
The teacher in a clothing class told the girls to buy their material and patterns to make their first garment. The patterns purchased didn't fit, and in some instances the material was ruined because there wasn't a sufficient amount to get the garment cut out properly.	(a) Teacher did not give the proper demonstration of taking body measurements in order to determine size pattern to buy. (b) Girls were utterly confused. (c) Teacher answered sarcastically.

Figure 1. Record Card Summarizing the Incident

a. Sympathetic, understanding	—	Unsympathetic, sarcastic
b. Democratic	—	Authoritarian
c. Friendly, commending	—	Unfriendly, disapproving
d. Ability to judge reactions of others	—	Inability to judge reactions of others

The area of Personal Qualities included references to the emotional stability of the teacher as revealed by the interaction of teacher with pupils and associates, and also behaviors that reflected honesty, fairness, and objectivity.

The area of Professional Qualities included the classroom practices of the teacher as they related specifically to the learning process. It covered the instructional skill of the teacher, knowledge of subject matter taught, organization of instructional materials, ability to diagnose individual and group weaknesses, and ability to provide necessary remedial instruction.

The area of Social Qualities referred to the teacher's face-to-face relationships with students and associates, and included ability to understand and appreciate the feelings of others, employment of democratic approach in human relationships, and friendliness.

Description of Categories—The fourth step of category formulation had to do with the preparation of descriptive statements, in terms of teacher behaviors, relating to each category. The behaviors in each sub-area were carefully studied and all "duplicate" behaviors (those which were so similar that they could be considered identical for practical purposes) were grouped together. A generalized descriptive statement was then written for each group of similar behaviors.

Refinement of Categories—In the final step the number of descriptive statements was reduced, by the still further combination of similar behaviors and the preparation of more generic statements to cover them.

Critical Requirements for Teachers

The following classification of the critical requirements for teachers was the outcome of utilizing the critical incident approach described above.

Summary

There is a need for a better understanding and definition of the patterns of personality traits and classroom behaviors that contribute to effective and ineffective teaching.

The present paper describes one technique for collecting reports of teacher behavior from qualified persons and formulating from such reports a set of critical behaviors that appear to contribute to effectiveness or ineffectiveness of teaching.

For the sample studied, teachers' critical behaviors were classified under three general categories: (1) personal qualities, (2) professional qualities, and (3) social qualities.

It is suggested that the critical incident technique might be employed profitably in local school situations in developing valid bases for teacher evaluation and as an aid to the in-service growth of teachers.

Personal Qualities

Effective	Ineffective
1. Is alert, cheerful, and enthusiastic in expression and manner.	1. Is dull, bored, and shows lack of dramatic qualities.
2. Exhibits self-control and good organization ability in midst of classroom demands.	2. Loses temper, is impatient, disorganized, fault-finding, easily disturbed in face of classroom demands.
3. Likes fun and possesses a sense of humor.	3. Is serious, too occupied for fun or humor.
4. Recognizes and admits own mistakes graciously.	4. Is unaware of, or fails to admit own mistakes.
5. Is fair and impartial.	5. Fails to maintain a fair, impartial, objective attitude.
	6. Is overcritical and suspicious, showing disapproval of child as a person.

Professional Qualities

1. Evidences a planned but flexible procedure anticipating individual needs and interests.	1. Shows rigidity of procedure; fails to provide for individual variation or differences.
2. Stimulates pupils through interesting and original materials and teaching techniques.	2. Uses uninteresting materials and poor teaching techniques.
3. Conducts well-planned, clear practical demonstrations and explanations.	3. Gives poorly-planned explanations, and develops subject matter ineffectively.
4. Is clear and thorough in giving directions.	4. Is unclear, vague, or incomplete in giving directions.
5. Is skillful in encouraging pupils to work through their problems and evaluate their own work.	5. Fails to give pupils chance to participate or make choices, and to evaluate their own work.
6. Disciplines in a quiet, dignified, positive, and fair manner.	6. Resorts to cruel, meaningless forms of physical correction.
7. Gives constructive help willingly and enthusiastically.	7. Fails to give help or gives it grudgingly.
8. Foresees and resolves potential difficulties.	8. Evidences inability to see and resolve potential problems.
	9. Fails to link course with larger educational objectives or reality.

Social Qualities

1. Shows understanding and sympathy in working with pupils.	1. Makes threats, uses sarcastic remarks, or in other ways shows lack of sympathy for pupils.
2. Is friendly, democratic, and courteous in relations with pupils.	2. Is tense, authoritarian, and antagonistic in relations with pupils.
3. Helps individuals with personal as well as educational problems.	3. Is unaware of pupils' personal and educational needs.
4. Commends effort and gives generous praise for work well done.	4. Fails to give approval and commendation for pupils' effort and activities.
5. Is able to anticipate reactions of others in social situations.	5. Is unable to anticipate reactions of others.
6. Encourages others to do their best.	6. Fails to encourage pupils to do best work.

PHOTOGRAPHIC ANALYSIS OF CERTAIN LETTER FORMS WITH RESPECT TO SPEED CHANGES AND STABILITY

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Three questions of major importance relating to the problems of handwriting and of letter forms are:

1. What scientific methods are available which can be used to analyze and select strokes and letter forms with respect to stability as well as speed of writing?

2. What are the comparative records of the forms studied with regard to the characteristics of stability and speed?

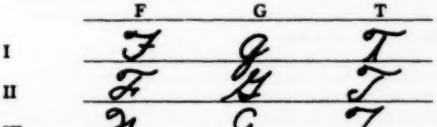
3. What principles can be derived from these methods and data which can be utilized in the selection of letters not tested in this study?

The photographic method of analyzing handwriting has been adapted to the purposes of this experiment. It has the advantage of being the most exacting and quantitatively suitable technique for the analysis of stability and speed. Some of the major specific measures in the determination of these characteristics are: duration and number of pauses, duration and speed of strokes and forms, percent of time to contact strokes, and percent of time to air strokes within the form.

Stability in writing, meaning no change, deterioration, or improvement of writing over a period of time, is measured in terms of changes in these specific measures.

The Procedure

It was found in a previous study[1] that the letters F, G, and T were written in many different styles. These forms were typified as follows:



For each letter, three forms were found which represented the many different shapes. Accordingly, it was necessary to employ an 'equated-group' method if the forms were to be tested for speed and quality. In the present experiment the 'equivalent-groups' method was used. For each of the three letter-forms for each letter F, G, and T, three good writers and three poor writers took part in the experiment. This plan involved duplication in the use of subjects in that the eighteen different subjects participating in the practice and testing of form F also were the same ones used in the experimental work done with forms G and T.

The eighteen subjects were chosen from a graduate class in Experimental Education in the School of Education at the University of Chicago. The Gettysburg edition of the Ayres Handwriting Scale was administered to the entire class of twenty-seven students. From the tabulation of scores in speed and quality, the subjects for the experiment were selected. The distribution of scores revealed that the average speed score for the good writers in each of the three groups was 119, and that the average quality score was 80, whereas the speed score for the poor writers was 104, with a quality score of 50.

The Training Period. —The subjects practiced on their particular letter forms for seven successive days, fifteen minutes per day, making a total of 105 minutes of practice for all three letters. Each fifteen-minute period was divided into three parts of five minutes each, and these were devoted first to the F, then the G, and then the T. In this way, monotony of practice was reduced. An instruction sheet, based on principles of handwriting set down in "How to Teach Handwriting" by Freeman and Dougherty, was given to each subject.

The practice period was relatively short, due to the difficulty of getting graduate students to spend more time with the project. This training period, however, produced gains in speed and in quality of writing, as judged by differences in

1. H. O. Boraas. "An Experimental Study of the Relative Merits of Certain Written Letter Forms with Respect to Legibility, with Speed and Stability as Related Factors," Journal of Experimental Education, V (1936), pp. 65-70.

scores between the initial and the final tests. For example, for form F, in speed, there was a gain of 8 percent in the final test; for form F a gain of 23 percent; for form F a gain of 17 percent. In deterioration, there were corresponding decreases of 67, 10, and 65 percent. Similar results were found for the letters G and T. These changes in achievement, due to the influence of practice and/or instruction, make possible a standardization of the degree of familiarity of the subjects with the forms assigned them.

The Final Test. —The final test was a photographic one. The test was given to twelve of the eighteen subjects. Only twelve subjects were used because of the great amount of film necessary for testing each subject. Photographic records were obtained from two poor and two good writers for each of the variation forms of the letter F. Similar records were obtained for the letters G and T.

The photographic final test was of indefinite duration, depending on the rate of writing the first and last nine letters of a four-minute writing exercise.

The Use of Photography. —The apparatus employed in this experiment consisted of the motion-picture camera, arc lamps, and projector located in the laboratories of the School of Education of the University of Chicago. The speed of the motor of the camera was reduced from thirty exposures per second to twenty-two by changing the ratio of the size of the wheel driving the camera and the motor wheel. This reduction was made because of the large amount of film needed in the photography of the writing of the subjects. Commercial motion-picture film was used in making the negative. Approximately eighteen hundred feet of film was used in the experiment.

Method of Studying the Records. —A film of a capital letter form was run through the projector to the end where a complete image of the entire writing was available. Tracings were then made of the images of the first and last group of nine letters of the test in order that the movements of the penpoint might later be described. After this, the film was run through again, one exposure at a time. The record of a letter, after being traced on the projecting board, was so adjusted that the image of the penpoint coincided with the beginning of the first stroke of the letter. The position of the pen was indicated by a short check line on the letter stroke. Following this, successive exposures of the film were projected, one at a time. The record of the letter on the projecting board was so adjusted that successive images of the penpoint fell on the corresponding parts of the letter. If the pen did not move with the progress of an exposure, a count was kept of the number of exposures after the first one had elapsed before the pen moved, and this number was written opposite the mark which indicated the position. The crowding of the points indicated a slowing down of the movement, whereas a spreading meant an acceleration. The time unit by which the duration of the pauses was measured was one exposure of the camera, which was one twenty-second of a second.

The Photographic Method in Relation to Speed and Deterioration. —Changes in the speed of writing are best analyzed by a study of speed curves.[2] In the records of the subjects each horizontal unit represents one exposure of the camera or one twenty-second of a second. The height of the column above each unit represents the distance in millimeters which the pen travelled during the corresponding camera exposure. The absence of a column indicates a pause of one twenty-second of a second. A series of columns represents a movement of the pen. The speed of movement in its successive stages is represented by the height of the successive columns and the duration of the movement by the number of columns. When a pause has occurred, there is a break in the movement. This pause may be regarded as marking the division point between successive units of the movement.

The Experiment

Speed of writing can roughly be determined by the average number of letters written per minute. Deterioration in quality (or a positive change) can be estimated by the method of comparing the quality of writing in the last ten letters as compared with those in the first ten in a two-minute test. In a supplementary test with the eighteen graduate University of Chicago students previously mentioned, three competent judges were employed to make comparisons of the first and last ten letters of a test series with respect to deterioration or improvement. A zero mark was given if there appeared to be no change between the first and last ten letters. A plus one, two or three was given if the last ten letters, compared letter to letter, were superior in quality to the first ten. A minus one, two, or three was given if the last ten letters were inferior in quality to that of the first ten.

Results of the Supplementary Experiment. —Statistical data with respect to speed and deterioration or improvement in quality is shown in Table I. For the letter F, form 3 shows the best records, whereas form 2 shows the poorest. For the letter G, form 4 shows the best records,

2. F. N. Freeman. The Handwriting Movement, Supplementary Educational Monographs of School Review and Elementary School Journal, II, No. 3 (1918).

TABLE I

SPEED AND DETERIORATION SCORES OF THE THREE GROUPS IN THE FINAL TEST, FOR LETTERS F, G, AND T

Letter	Form	Speed	Quality Change
F	1.	37.50	-1.39
	2.	37.42	-3.22
	3.	45.00	-0.50
G	4.	52.58	-0.61
	5.	52.50	-2.83
	6.	48.58	-0.72
T	7.	38.70	-0.95
	8.	44.00	-3.17
	9.	51.67	-1.33

whereas form 5 shows the poorest. For the letter T, form 9 shows a slightly superior record to that of form 7, whereas form 8, because of much deterioration, shows the poorest record.

Photographic Analysis of Letter Forms. —Of the original eighteen subjects in this experiment, twelve were selected for purposes of photographic analysis and statistical treatment. Only two of these twelve cases can be illustrated, one a poor writer of the form 8, the other a good writer of the same form.

Poor Writer, Form 8. —The speed curves of form 8, written by poor writer 12, show a variety of speed patterns for the execution of the stem. The speed patterns for the cap, however, are quite uniform. These characteristics are shown in Figure 1.

Letters 1, 2, 3, and 4 of the first group[3] show different speed patterns for the stem in every case. The situation is similar in the last group of letters. The accompanying deformation of the stem, which is a straightening of the line, occurs in the cases which are written with proper speed changes as well as with those which are not. In most cases, the lower part of the stem is made as a loop. The chief reason for this deformation is the fact that a pause at the fartherest point to the left has not been provided in many of the letters. The stem has not been properly divided into units to correspond to the strokes of which it is constructed. Evidence of the deterioration in the writing of the loop-like formation is found in the increasing tendency to omit the pause in the last group of letters.

The air movements have been executed in a direct manner. The duration of the movement varies considerably. In letter 9 of the last group the air movement was executed in one unit of time, whereas in letters 7, 8, and 9 of the first group it was executed in four units. This is a long duration as compared with that required by such a contact stroke as the stem.

The caps were made in a uniform manner with greatest speed at the middle and towards the end of the stroke. In spite of the retardation in speed at the formation of the small loop, there is a large amount of deformation of this part in many letters. Furthermore, the double-curved characteristic of the cap is absent in all of these lines, even though speed changes are apparently well-adapted to the stroke.

Good Writer, Form 8. —The record for form 8, written by subject 7 and presented in Figure 2, shows a variety of speed patterns for all strokes of the letters. The chief defect in writing is the absence of orderly rhythmic movement. In many of the letters there is no acceleration towards the middle of the stroke. For example, in the execution of the downward stroke of the stem in letters 2, 4, and 5 of the first group and 1, 2, and 3 of the last group there is no indication of accelerated speed, with retardation at both ends. This stroke is often followed by a short return swing which is made at constant speed throughout.

The lack of proper adaptation of speed to the downward strokes probably contributed to the straightening of the line. There are few if any of the lines which show a double-rocked curve, even in those letters where speed has been accelerated at the middle of the downward stroke.

Generally, speed has been retarded slightly at the bottom of the stem. It is probable that more retardation should have been provided at this place because of the presence of angular formations. Such a deformation was no doubt aided by drawing a straight line down to the bottom line. Usually, there is an angular formation at the junction of the reverse curve at the bottom and the return stroke. The return stroke is made of varying lengths.

The air movement to the cap is direct in most cases, but is made with varying duration from letter to letter. In letter 1 of the first group this movement is made in two units of time, whereas in the letters 6 and 9 it is made in four units.

The cap is usually made with greatest speed at the middle of the stroke. In letter 9 of the first group, however, speed is accelerated at the end of the stroke. A straightening of the line accompanies the change.

Comparison of Strokes and Forms

In order to judge the superiority or inferiority of strokes certain characteristics of the writing of strokes must be noted. The specific characteristics employed in the following summary are: deformity, speed changes, speed, and duration.

Deformity of stroke is measured in terms of percentage of the total number of strokes deformed. Deformities are judged according to the variations of stokes from the standards of the model forms. The quality of speed changes is measured in terms of the percentage of deformed strokes with bad speed changes and of the percentage of correct strokes with good speed changes.

3. Indicates the picture of the first nine (group) of letter forms in the four-minute test. The last nine letters of the test are shown below. The comparison of these two groups of forms makes possible a study of stability, deterioration, and improvement as the writing continues.

Figure 1. Speed Curve of a Poor Writer, Subject 12

Figure 2. Speed Curve of a Good Writer, Subject 7

According to Freeman[4], speed generally is accelerated at the middle of strokes and retarded at sharp changes in direction. There is a correspondence between the speed of the movement and the length and simplicity of the stroke. Successive strokes are produced with similar speed changes. The relative speeds of writing are roughly measured in terms of the speed of contiguous parts.

Speed of writing a stroke or form is calculated by dividing the distance travelled by the time consumed for its execution.

Deterioration (or improvement) is measured in terms of differences in scores between the first and last groups of nine letters of each test series in the characteristics of deformity and speed changes. A plus sign is used to show improvement; a minus sign to show deterioration.

Comparison of Strokes. —Table II shows a summary comparison of various characteristics of strokes. The three strokes with the highest percentage of deformity are strokes 1, 6, and 10. Strokes with the least deformity are 2, 11, and 7. Of the strokes deformed, 1, 6, and 8 show the highest percentage of bad speed changes. Of those correct, strokes 4, 12, and 5 show the highest percentage of good speed changes.

Let us now consider the nature of the deformities and also the nature of the speed changes involved in the writing of letter strokes. The chief point to consider is that of the relation of strokes which are deformed by being straightened and the corresponding rapid speed at the beginning of the stroke. Strokes 1, 6, 7, 8, 9, 10, and 11 are curved lines that have been straightened. In each case the corresponding speed change has been that of very rapid speed at the beginning of the stroke. There is a positive correlation between these two conditions. Analysis of strokes 4, 5, and 12 reveals that deformity is related to very rapid speed.

A consideration of the speed of strokes shows stroke 6 and stroke 3 to be speediest in execution. Strokes 1, 6, and 10, which have been judged strokes of much deformity and of bad speed changes, show high speed scores. In the cases of strokes 1 and 6 it appears that this high speed is undesirable in the light of these conditions. Stroke 10 is made with medium speed; however, since it shows much deformity it is probable that it is written too rapidly. This stroke, being a double-rocked cap in letters F and T, is too often straightened when executed with too much speed. Forms for the letters F and T, involving a short double-rocked cap, include stroke 11 which shows the slowest speed of all the strokes.

The problem of stability of writing is of such great importance that a careful consideration of the aspects of deterioration and improvement should be made. If no change has been made in the quality of writing in the last nine letters of the test as compared with the first nine, a zero mark is given. If the last nine show a better quality than the first nine forms, a plus sign is given. If the last nine show a poorer quality than the first nine letters, a minus sign (deterioration) is given. The signs or numbers given include the increase or decrease of: strokes deformed, strokes deformed with bad speed changes, and (a decrease) in correct forms with speed changes. Strokes 9 and 1, both reverse curves, show the largest amounts of deterioration, whereas strokes 5 and 8 show the most improvement. The upward underswing shows a small amount of deterioration whereas the double-rocked cap shows a small amount of improvement in stability.

Summary of Data about Strokes. —Strokes 1 and 6 are obviously defective in most respects. Double-rocked stems or caps are particularly subject to deterioration under high speed. The better strokes are recognized as the following: 2, 3, 4, and 11. Strokes 2 and 3 are straight line strokes, easy of execution and stable in continuance. Stroke 4 is a downward loop found in the F (also in G and J). It represents a continued curved line which suffers little in deterioration, but is made at high speeds.

Comparison of Forms. —In Table III a comparison of various features of writing for the three forms for each of the letters F, G, and T is presented. For the letter F, form 3 shows a superior record in all four aspects measured. Of the three forms presented, form 3 shows the fewest number of pauses, the shortest time duration, the smallest percent of time devoted to air strokes within the form, and the largest percent of time devoted to contact strokes. Form 2, on the other hand, shows a poor record, particularly with respect to duration and time devoted to air strokes. The decrease in the number of pauses and in duration was only -1 as compared with -18 and -7 for form 3. (Change from first nine letters to last nine letters in the test series.) Thus form 2 does not appear to improve with continued writing.

For the letter G, the scores are not widely different. The three forms seem to be about equally good in the factors measured. The large, easy strokes and loops of the G produce records much like those of form 3 of the letter F. Broad, single curved lines are easier to execute than are the double-rocked lines in such forms as 1 and 2 of letter F.

Data for letter T shows that form 9 is quite superior to forms 7 and 8. It is observed that this superiority is not confined to the four features measured, but is apparent in the observation with

4. F. N. Freeman, ibid., p. 95.

TABLE II

SUMMARY COMPARISON OF VARIOUS CHARACTERISTICS OF STROKES

	Deformed %	Nature of Deformity	Deformed with bad speed changes %	Nature of Speed change	Correct with good speed changes %	Speed*	Deterioration**
1.	91	Straightened	98	Fast start	46	2.8	-13
2.	0	.....	0	.....	68	2.5	+ 5
3.	25	Curve right	0	.....	97	3.1	+ 1
4.	37	Slanted	41	Fast bottom	100	2.8	- 2
5.	23	Too long or short	44	Fast	100	...	+21
6.	88	Straightened	90	Fast start	53	3.4	- 3
7.	15	Straightened	86	Fast start	73	... 2.5	- 9
8.	26	Angular or shallow	88	Fast before vertex	73	2.4	+16
9.	25	Angular	76	Fast before vertex	74	2.2	-26
10.	48	Straightened 1 curve	72	Fast hump valley	80	2.5	+ 3
11.	12	Straightened	78	Fast hump	90	1.8	+ 6
12.	30	Opened, too horizontal	31	Fast at sharp curve	100	...	+ 5

* Distance divided by duration.
**Minus sign is deterioration; plus sign is improvement.

TABLE III

COMPARISON OF VARIOUS FEATURES OF WRITING FOR THE LETTERS F, G, AND T

Letter Forms	Number of Pauses (Av.)*	Duration of Forms	% Time to Contact Strokes	% Time to Air Strokes from Within
1.	41 -6***	271** -4	48	8.0
2.	42 -1	294 -1	53	10.2
3.	23 -7	185 -18	78	0.0
4.	26 -3	201 -10	62	0.0
5.	23 -0.3	192 -6	72	0.0
6.	27 -0.6	191 5	61	0.0
7.	42 -0.2	248 -16	45	9.7
8.	30 0.7	210 -11	55	12.9
9.	27 -1.2	184 3.5	61	0.0

* Represents the average of four subjects, two good, two poor writers.
** Duration in terms of 22nds of a second.
***Differences between first and last nine letters of the test series. A minus sign indicates decrease in the element; a plus sign indicates an increase.

respect to simplicity of stroke and outline. Form 7 and form 8 show relatively bad records because of the double-rocked lines in stem or cap. This feature also characterizes form 2 of the letter F.

Conclusions

This study has concerned itself with two questions:

1. What exact and quantitative methods can be used to analyze and select strokes and forms of letters with respect to speed and stability?
2. Which strokes and forms of the letters F, G, and T are most speedy and stable? Why?

In answer to the first question, it is found in this investigation that the photographic method of analyzing letter forms and strokes is a suitable technique. This method gives the most detailed quantitative scores available for the analysis of the elements of speed and stability of writing.

Data in answer to the first part of question 2 is presented in this study. The second part of this question is answered by the following quantitatively induced considerations:

1. Straight lines are generally written most rapidly and with the least amount of deterioration and deformation.
2. Rocked or double-curved lines tend to be made with excessive initial speed and much deterioration, consisting chiefly in straightened lines.
3. Single-curved strokes, especially those of the approach underswing type, tend to be made with excessive initial speed, resulting in straightened lines.
4. Speed changes for any stroke may be erratic for good as well as for poor writers. It is probable that simplicity of stroke is a more fundamental factor in writing than are certain speed change patterns.
5. Simplicity of form based on continuous free flowing lines is prefereable to complex forms involving sharp changes in direction accompanied by an excess number of pauses and air movements within the form.

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REACTIONS OF NEGRO CHILDREN TOWARD NEGRO AND WHITE TEACHERS

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John is a 7-year-old Negro boy in a Harlem public school. In this school, as in other Harlem schools, there are both Negro and white teachers. John's teacher happens to be white. John is looking at a set of test pictures representing the heads of teachers. There are attractive, pleasant looking teachers among these pictures, and there are unpleasant, mean-looking teachers. Negro and white faces are equally represented.

John is asked to look through these eight pictures and pick out the ones he'd like to have for a teacher. He chooses only the two pleasant looking white teachers, saying of the Negro pictures, "I like a white teacher more."

On the other hand, there is a 9-year-old Negro girl in the school who seems to have very different feelings. Her teacher is Negro. She includes both of the pleasant Negro pictures in her choices, saying of one of them, "I like her very much. She reminds me of my teacher."

What accounts for such a difference? Age of the children involved? The fact that one is a boy and the other a girl? The different experiences each has had in the classroom, one with a white teacher and the other with a Negro teacher? And how typical are these attitudes? What do we know about the way children react to color in the adults who are their teachers?

Children's attitudes toward each other and toward themselves in respect to color have been rather widely explored by Hartley and others. The area of children's attitudes toward adults, however, is relatively untouched.

Our experiment in the Harlem public school represents only a tentative beginning. Carried out with only 51 children as subjects, its findings necessarily can point only to possible trends and avenues for further research. So much interesting material came to light, however, that it seems important to present it for the sake of the groundwork it represents. Though findings are not conclusive, the points of departure for further research are rather clearly indicated.

In presenting to the children our pictures of pleasant and unpleasant appearing teachers of both races, we were exploring only one small segment of the general problem, that segment dealing with the relative importance of color on the one hand, and personal qualities such as kindliness and pleasantness on the other, in the children's thinking about their teachers. Specifically, we hoped to find out, first, whether the children would be influenced more by color or by the pleasant-unpleasant aspect of the pictures when asked to pick out those that reminded them of their teachers; and second, how much the color factor would enter in at all when they were asked to choose the pictures they liked.

Toward these ends, the children were asked only two crucial questions about the pictures, though there were many other decoy questions interjected for reasons of tact. First, each child was asked to look through the pictures one by one and pick out those teachers who reminded him of his own teacher in any way. Second, he was asked to choose those whom he would like to have for his own teacher, and to indicate his favorite one among his choices.

The pictures themselves were prepared especially for this test, painted in bright attractive colors. Our original plan had been to represent not only pleasant and "mean" faces, but pleasant and unpleasant schoolroom situations. The teachers were shown in such attitudes as taking comic books away from children, singing with a group of children at the piano, etc. A preliminary experiment, however, showed us that this introduced too many complicating factors. For our present test, then, we covered over all of the picture except the teacher's face and a little of her dress at the neck.

The pictures were judged beforehand by a group of adults, particularly with reference to the accurate representation of the Negro-white factor, and were found satisfactory. That they had many shortcomings became apparent only later, as the children themselves commented on the pictures. This will become evident as we report the findings.

In representing the Negro and white faces, an attempt was made to avoid extremes. The Negroes were only medium dark in skin color; the white teachers were light brunettes. We felt that by keeping in this middle range we would be approximating the real life situation, in which there are many mulatto types, as well as dark skinned and dark haired white types. It was our hypothesis that in this real life situation some children may find the personality aspects of their teachers more important in their feeling and thinking

than the color aspects. We did not want to distort this situation and its dynamics in our test, as we thought we might if we confronted a child with pictures of very dark Negro faces and very light white faces, and then asked him to pick out those reminding him of his teacher.

The 51 subjects, all Negro children in the same Harlem public school, were distributed as follows, according to teacher, age, sex:

Children with white teachers

Age:	6-7	8-11	Total
Boys	7	9	16
Girls	8	11	19

Children with Negro teachers

Boys	2	6	8
Girls	4	4	8

The 8-11 age grouping may appear to be too inclusive. Actually, however, there were only one 11-year-old and four 10-year-olds in the group. The majority were 8 and 9 years of age. These groupings are not too important, anyway, since the numbers are so small. We were not able to really explore age and sex differences.

The children, chosen largely by lot, were taken one at a time from their classrooms to a private testing room. The test was, of course, presented as a kind of game, and the majority of children were eager to come. Dr. Biber administered some of the tests, Miss Lewis others. An effort was made to find a Negro examiner for a third tester, but this was not possible. It would have been interesting to compare results.

Part I

"Let's see if any of these teachers remind you of your own teacher."

How influenced do the children seem to be by the color factor when they are looking at pictures with the intent of finding resemblances to their own teachers? Are they looking primarily at color or at facial expression? Will children with white teachers ever pick out Negro pictures, and vice versa? If they don't, do they come right out and say, "She's the wrong color?

Our findings show distinct differences in the attitudes, or perceptions, of the children, according to whether their own teachers are Negro or white.

In brief, it seems to be easier for children with Negro teachers to pick out pictures of white teachers as resembling their own than it is for children with white teachers to pick out Negro pictures. Fifty percent of the children with Negro teachers include pictures of white teachers whereas only 28 percent of the children with white teachers include Negro pictures.

The children with white teachers object openly to the skin color factor more often than the children with Negro teachers do. In fact, in the white group there are six children (17 percent) who consistently raise this objection on every Negro picture in the series, in no uncertain terms: "No, she's colored." "No, she's too dark." "No, my teacher she is white." Etc.

There is only one child (6 percent) in the group with Negro teachers whose skin color criterion is as rigid as this, leading her to pick out all the Negro pictures and none of the white, for this specific reason.

Furthermore, there are a number of children (37 percent) in the group with white teachers who, though they do not mention skin color as a criterion on every Negro picture in the series, do mention it at some time or other on Negro pictures that they exclude. Only 19 percent of the children with Negro teachers come out with any mention of skin color as a reason for not picking white teachers in this part of the test. Many more of these children are able to make their selections apparently without reference to the skin color factor at all, neither saying anything about it nor implying awareness of it in any way. (Compare 50 percent with 28 percent.) That is, the fact that they select and reject pictures of both races for the same kinds of reasons indicates an apparent indifference to the color factor. Such reasons are by no means restricted to whether or not the teacher looks nice, is "fussing," etc. This pleasant-unpleasant aspect of the pictures is of only secondary importance here, as we shall indicate in more detail later. Instead, these reasons may have to do with whether or not the teacher wears glasses, has long hair, short hair or grey hair; and in a few cases the choices seem to be quite random or with irrelevant reasons, suggesting confusion.

These children select proportionately more pictures from the whole series than do the children in the other group. They seem freer to find resemblances. Their 49 choices represent 38 percent of the total possible choices, whereas the children with white teachers select only 26 percent of the total. The following table showing the proportions of Negro and white pictures selected by both groups sums up the differences graphically:

Selections of Children with White Teachers

N = 73 (.26)

White pictures	.78
Negro pictures.....	.21

Selections of Children with Negro Teachers

N = 49 (.38)

White pictures.....	.42
Negro pictures.....	.56

We are dealing, of course, with a very small number of children. But the trend seems clear. The children who have Negro teachers will see resemblances in the white pictures. The children with white teachers are less ready to admit likenesses in the Negro pictures. Furthermore, children in this latter group articulate their awareness of the skin color factor more than the others do.

Does this mean that the children with Negro teachers have a wish for, a preference for the white teacher, due to the prejudice that exists in our culture, and so are very ready to accept a picture of her as "like their own teacher"?

Or could it have something to do with actual perception of faces? That is, in a culture where there are so many mulatto types, is it easier to look for Negroid characteristics in the "white" face than it is to take an unmistakable Negro as a white person? That is, when children with Negro teachers include white pictures, does this mean that they are choosing faces that could potentially be Negro faces, whereas children with white teachers are faced with no such potential range when they look at pictures of Negro faces? These are, perhaps, the two primary questions raised by this material, and we shall have occasion to return to them as we proceed.

If preference for the white teacher is a major factor involved here, one may wonder if there were any children at all in the group with white teachers who revealed that they were aware of the racial difference and yet were willing to say that a Negro picture reminded them of their teacher in some way.

There were only three such children, all of them making it clear that the resemblances they saw were limited. One, a 9-year-old girl, says of one of the nice Negro pictures, "Yes the whole face is like her except that she isn't that color." An 8-year-old boy says of this same picture, "A little bit. But my teacher's got a light face and different eyes." The third child, a 9-year-old girl, does not actually say this is a Negro teacher, though is undoubtedly implying it. She seems clearly enough to recognize the Negro factor on the other three Negro pictures in the series. Her reply on this one is, "A little bit, 'cause my teacher has her hair up a little bit."

It is interesting to note that when Negro pictures are chosen by children in the group with white teachers, —and there are ten children, or 28 percent who do, most of them giving no clue to any awareness of color difference, —it is always done by girls, with the exception of the one boy noted above, who makes it clear that he knows this picture is not the right color. Is there less readiness in boys to accept the Negro teacher than in girls, who perhaps are more able to identify themselves with her? This seems to us to be one of the important questions for further research. Our findings here are of course not very conclusive, yet later on there is still another piece of evidence in this direction.

Age differences, also, we cannot really study with our small numbers, yet there are suggestive findings which at least pose interesting questions. In the group with white teachers, the six children who rigidly reject every Negro picture because of the skin color factor, plainly saying so, are all in the 6-7 year old age range. On the other hand, there are ten children who do not say anything about skin color per se, but yet will pick only the white pictures. All but two of them fall in the 8-11 year old group. Some of these children, it is true, may be expressing awareness of the racial difference when they raise such objections as "different face," "black hair," "lips," "mouth"—but none of them come out bluntly with such statements as "She's colored and my teacher's white." Is there a certain caution or tact or repression learned as the child grows older? Does the presence of the white examiner influence these replies? Or do Negro characteristics other than skin color take on greater importance with age? There is room for a great deal more delineation of the factors that are seen as Negro characteristics in the eyes of Negro children. This is one of the areas to explore in further testing.

It is difficult to see any trend in age and sex differences in our children with Negro teachers. This may be partly because the group is so small, only 16 children, and also because the problem involved for them is an entirely different one. The three children who come out plainly with mention of color as a reason for not choosing the white pictures are all in the 8-11 group, two boys and one girl. The psychological factors involved here, however, seem quite different from those involved in seeing resemblances in Negro pictures when your own teacher is white.

Before turning to a consideration of the children's responses to the pleasant or unpleasant tone of the pictures, we might point out here one of the interesting aspects of the meaning of "skin color" as revealed in the comments of several of the children. There is evidence that not "color" per se, but degree of color is the measuring rod. Those who mentioned skin color often were looking at the pictures to see whether the skin was as light or lighter than their teacher's. There were even one or two instances of children with white teachers excluding white pictures for the wrong

degree of color, when they were looking for resemblances to their teacher. For instance, one 8-year-old boy found two of the white pictures "lighter than my teacher." And a child in the group with Negro teachers finds one of the nice Negro pictures too dark to resemble her own teacher.

We have already indicated that the pleasant-unpleasant aspect of the pictures was not of primary importance in this part of the test, at least not to the children with white teachers. There were only two of them (6 percent) who made their selections entirely on this basis, regardless of the color of the faces. Both of these children were six-year-old girls. One of them expresses her feelings in terms of whether or not the teacher is "fussing." The other one is looking at ugliness and prettiness: "No, she's too ugly," "Yes, she's pretty. Face and hair is pretty."

There were others—to the extent of 28 percent—who made some reference to pleasantness or unpleasantness, along with other reasons. And, of course, some may have been influenced by the expression of the faces without knowing clearly how to verbalize their reaction. It is extremely hard to interpret a response like "Yes, her face is like her." The table of actual choices gives the story more accurately than the children's words:

Selections of Children with White Teachers

N = 73

Negro Pictures		White Pictures	
Nice	Mean	Nice	Mean
12	4	34	23
.16	.05	.48	.30

What this means is that the children's primary criterion for resemblance is color, not pleasantness; that many children find more resemblance to their own teachers in a mean white picture than in a nice Negro picture. However, once the color factor has been taken care of then niceness has some importance. The children do see more resemblances in the nice than in the mean pictures.

Those who select the mean faces, it should be explained, are largely those children in the youngest age group, who make a blanket selection of the four white teachers, and a blanket rejection of the four Negro pictures. In addition, there are a few whose selections seem rather random or irrelevant, suggesting some confusion about the test, or difficulty in discriminating.

When we turn now to the children with Negro teachers, we find that here also pleasantness is rarely the primary and sole criterion. There is only one child, a 6-year-old boy, who seems to be making his selections in terms of whether or not the teacher "has a smile on her face."

However, there are many more children in this group who make some reference to pleasantness as one of the criteria of importance to them. As in the other group, it is sometimes difficult to determine the meaning of the reasons given, but it seems safe to assume that expressions such as "No, her nose is not out and her mouth is not like that," refer to the sharp cross features of the teacher pictured. As many as 37 percent of the children seem to be expressing an awareness of the pleasant-unpleasant factor. Their actual selections also show that for them the feeling for pleasantness can operate in a wider range than it could for the other group. They are not so restricted by the necessity to eliminate color first:

Selections of Children with Negro Teachers

N = 48

Negro Pictures		White Pictures	
Nice	Mean	Nice	Mean
19	9	12	9
.38	.18	.24	.18

Unlike the situation in the other group, the "mean" selections here obviously cannot be accounted for by a tendency of some children to sweepingly include all the pictures of the right color, regardless of how cross and unpleasant the facial expression may be. There is only one child in this group who is making his selections this way. On the other hand, there are three rather discriminating older children who seem to be attempting to look at many separate features, finding likenesses in both Negro and white, and pleasant and unpleasant pictures. And as in the other group, there is some evidence of confusion, in at least one child.

To sum up briefly the results on Part I of the test, we can say that there is considerable evidence that these Harlem children feel that the white teacher has primacy. The children with Negro teachers find it much easier to see resemblances in white pictures than children with white teachers do in the Negro pictures. And children in this latter group openly express their objections on the basis of skin color more often than the children with Negro teachers do.

The pleasant-unpleasant aspect of the pictures is of only very secondary importance, when the children are looking for resemblances to their teachers. Though the majority of the children see more likeness in the nice pictures than in the mean pictures, the color aspect—the primacy of the white color—must be reckoned with first. For children with white teachers, this means that very few resemblances can be seen in Negro pictures, no matter how pleasant they may be.

For children with Negro teachers, it means that though most of the resemblances are seen in the Negro pictures, the children can more often point to a picture of the opposite race and say, "She's like my teacher."

Part II

"Now you can choose the ones you would like to have for your teacher."

What happens now? If the children have a preference for the white teacher, do they exclude the Negro pictures in choosing the teachers they would like to have?

This is not the case. Taking the group of children as a whole, regardless of whether the classroom teacher is Negro or white, we find the preferences distributed as follows:

Choices of Pictures

N = 221

Negro Pictures		White pictures	
Nice	Mean	Nice	Mean
78	24	94	25
.35	.11	.42	.11

We see that the children are influenced by pleasantness much more than by color. It is true that the white teacher gets a small edge of preference, though the difference between 35 percent and 42 percent should not be taken as very significant, in view of our small numbers.

When we consider the children in their two groupings, those with white teachers and those with Negro teachers, there are some differences in line with what we might expect, though by no means indicating a complete rejection of the Negro teacher by children who have white teachers:

Choices of Children with White Teachers

N = 147

Negro Pictures		White Pictures	
Nice	Mean	Nice	Mean
50	13	66	18
.34	.09	.44	.12

Choices of Children with Negro Teachers

N = 74

Negro Pictures		White Pictures	
Nice	Mean	Nice	Mean
28	11	28	7
.37	.15	.37	.10

We see that children with Negro teachers include the nice Negro pictures to the same extent as the nice white. The children with white teachers are not so ready to give the Negro teacher an equal place in their feelings, yet when she is pictured as a pleasant person, this weighs heavily with them. They say of these pictures, "Yes, she's nice." "I like her, because she look like she got a nice class." "Yes, 'cause she's pretty." "Yes, she looks like she's speakin' nice." "Yes, she laughs."

The question comes to mind at once, are these children who include Negro pictures all girls? There is some tendency in this direction, apparently, though it is only a slight one. Ninety-three percent of the girls are willing to include Negro teachers compared with 79 percent of the boys. And as might be expected, it is the boys in the group with white teachers who are least ready to include the Negro picture. However, it is not the case, as might be expected, that the boys who are ready to choose Negro pictures are all from the older group. It will be remembered that in selecting resemblances, the children with white teachers whose color awareness was plainly outspoken were the younger children, and that there were six such children who did not select any Negro picture from the series, because of their strong awareness of the Negro factor. There is no clear age difference in the boys on this part of the test. We find that 78 percent of the 6-7 year old boys are willing to choose pictures of Negroes for teachers they would like, and 80 percent of the older boys.

Just as there seems to be no trend in age difference for the boys here, so also there is none for the group in general. The difference between boys and girls can be explored a little further, however. The children were asked to choose their one favorite picture after they had chosen all they would like to have for teachers. Differences between boys' and girls' favorites are quite striking.

Only three boys, or 14 percent, pick out one of the nice Negro faces as a favorite, while eight girls, or 30 percent, choose Negroes as favorites. The factor of whether the child's own teacher is Negro or white seems to further sharpen this picture:

Choice of Favorite Teacher

Children with White Teachers

Boys (N = 14)

No. 4, Nice White	.71
No. 5, Nice Negro	.14
No. 1, Nice White	.14

Girls (N = 19)

No. 4, Nice White	.58

No. 1, Nice White	.26
No. 7, Nice Negro	.10
No. 5, Nice Negro	.05

Children with Negro Teachers

Boys (N = 8)

No. 4, Nice White	.62
No. 1, Nice White	.12
No. 5, Nice Negro	.12
No. 3, Mean White	.12

Girls (N = 8)

No. 7, Nice Negro	.37
No. 5, Nice Negro	.25
No. 1, Nice Negro	.25
No. 4, Nice White	.12

It looks as though the fact that a boy has a Negro teacher does not make him disposed to choose a Negro picture for a favorite. Only one of our eight boys with Negro teachers choose a Negro favorite. On the other hand, if a girl has a Negro teacher, this may have some influence on her preferences. Our girls with Negro teachers choose more Negro than white pictures as favorites. We repeat that these findings on such a very small group cannot be considered as anything more than suggestive as possible trends for further exploration. It seems a likely hypothesis, however, that Negro girls may find it somewhat easier to identify themselves with and thus accept the Negro woman who is their teacher. It is possible that some of these girls may be looking forward to careers as teachers themselves, with a feeling that such positions carry with them a good deal of status. In fact, Negro girls in this school have been overheard to say just this.

It will be noted that on the whole, nice white picture number 4 is greatly preferred to nice white picture number 1. This may have something to do with the fact that number 4 was a much larger head than any of the others. This is one of the factors that should be eliminated in any further testing.

Are there children who state pointblank that they would not like a teacher who is a Negro, either when they are choosing a favorite or when they are selecting all the pictures they like? There is very little indication of this. In our group with white teachers there are only five children, or 14 percent, who actually mention color as a reason for choosing the white, or rejecting the Negro picture, and another three, or 8 percent, who reject all the Negro pictures without giving the color factor pointblank as a reason, but may be implying it, ("Has big lips," etc.,). Then there is one child who rejects the Negro teacher because he seems to think that "she will let the children fight." This attitude is far from typical, and is expressed by only one other child out of our total of 51. On the other side of the ledger entirely, there is one, an 8-year-old girl, who chooses both the nice Negro pictures, giving as her reason on one of them that she likes the face and eyes. When questioned what she likes about them, she says, "'Cause brown." This is not entirely clear, but may refer to the skin color factor.

In the group with Negro teachers there is only one child who mentions color as a reason for not choosing a picture. This is the child referred to above, who thinks the Negro teachers will let children fight. And there is one child who mentions color as a reason for liking one of the nice Negro pictures, "Yes, 'cause she's colored."

These are smaller proportions than occurred when the children were looking for resemblances. Certainly the majority of the children in both groups, when asked to select all the pictures they like, are looking chiefly for a pleasant teacher. And they often express this very clearly in such ways as:

"No, she looks like she's going to beat a child."
"Yes—smiling."
"No, mean. Yelling too."
"Yes, she's nice."
"Yes, she looks like she got a nice class. Lets the children play."
"No, her face is crookled up like she mad."
"No, she looks mean."
"Yes, because her face is cute."
"She looks awful mean."
"No, she looks too cranky."
"Yes, 'cause she's kindly."

A good proportion of the children in both groups choose just the two nice white pictures, rejecting all of the others. However, unpleasant pictures are chosen to the extent of 21 percent for children with white teachers, and 25 percent for children with Negro teachers. How can this be explained? Confusion on the part of the children, as we suggested was a factor in Part I of the test? Desire for a cross teacher? Or do some of the pictures fail to convey the intended expression?

A combination of these factors is probably at work here. In the first place, there undoubtedly is confusion on the part of some of the children, particularly those in the 6-7 year age range. The child who chooses every picture in the series and gives as his reason every time, "Yes, she colored," (or "Yes, she white," for a white picture) seems not to have clearly understood what was wanted.

On the other hand, there are two children, one in each group, who do seem to want cross teachers—just cross enough, that is, to keep a class in order. This is how a 7-year-old girl

with a white teacher explains her choice of a mean white picture: "Because she look like she get after the children." When questioned further about this, she explained, "Because the children are so bad in my class." However, this child did not want teachers who were "too mean."

Most important, however, is the likelihood that some of the mean pictures were not always seen as unpleasantly mean. The evidence is particularly clear in the case of the Negro picture number 6. Four of the children who chose her expressed very clearly their feeling that there was nothing objectionable to her:

> Girl, age 6—"Yes, she is nice. She have on nice earrings, dress."
> Girl, age 8—"Yes, 'cause she's kindly."
> Boy, age 6—"Yes, she looks more like my teacher."
> Boy, age 10—"Yes, I like the way she's looking, and she's got a pretty color of hair."

There is other evidence that her facial characteristics were definitely misunderstood by at least a few children, who at various times in the test referred to this teacher as "sneezing," "almost crying," or having "earrings." There were actually no earrings in the picture. Children who saw earrings were misled by the artist's way of picturing the ear. In Part I of this test, also, this particular picture was selected more often than the other "mean" Negro picture by children with Negro teachers. Here again is evidence that a painted set of pictures can have serious drawbacks.

In summarizing results on Part II of the test, we might point particularly to three important findings that seem to emerge from this material:

1. The children who have had actual experience with Negro teachers in the classroom choose as many (in fact, more) Negro pictures than white, when asked to pick out all the pictures they like. This suggests that experience with Negro teachers tends to modify the preference for the white teacher.

2. All of the children are strongly influenced by the pleasantness or unpleasantness of the faces, in making their choices. Even children with white teachers are very ready to include a picture of a Negro teacher who appears to them "kindly" and smiling.

3. Girls seem to be more ready than boys to accept the Negro teachers. Girls who have Negro teachers in their own classrooms choose more Negro pictures than white, even when they are selecting their one favorite picture.

There may be, of course, the possibility that at least some of the children did not feel free to reject the Negro pictures outright, even if they had wanted to. Is there a chance that in selecting resemblances, the children can let more of their real feelings slip in through the "back door" than when they are asked point blank to show to white examiners the pictures they like? Or is the preference for the white teacher an evaluation which operates in slightly different ways, according to the implications of the situation?

Such questions as these point to the need for further research around this focus: What kind of primacy does the white teacher have in the eyes of Negro children? Under what conditions can it be modified? Are girls more ready to accept the Negro teacher than boys? What differences are there in feelings about color—and the possible freedom to express them—at various age levels?

Further research on this problem should also take into consideration the area of perception of the Negro factor. We have already suggested that children may find it easier to see Negroid characteristics in the pictures of white faces than white characteristics in Negro faces. Closely allied to this are other factors related to the Negro child's concept of "Negro," which should be allowed for in further testing. As we have pointed out, hair, lips, mouth, nose have importance to the children as distinguishing features. Skin color is by no means the sole criterion. And even "skin color" itself should not be thought of in static terms. To the Negro child, "color" is not a simple matter of yes or no. There is considerable evidence that its significance to children lies in its degree.

The findings of this preliminary experiment, if verified in further testing, should be of the utmost importance to all educators who are working in the area of intercultural relations. There is no getting away from the arrow that points to certain concepts of primacy of the white teacher in the eyes of these Negro children; yet at the same time there is childhood's universal wish for the kindly adult protector, the teacher who "laughs" and "speaks nice."

The children in this study have made it overwhelmingly clear that they are drawn to the pleasant teacher; that they do not like the "yelling," "fussing," "cranky" teachers. This is perhaps something that all of us know, if we stop to think of it. Yet we are apt to forget what powerful weapons kindliness and laughter are. There is evidence in this study that many children will think first of how "nice" a teacher is, and only

second of what color she is, when making choices of the teachers they would like to have.

It is clear, too, that those children who can overlook the color aspects and center primarily on the pleasant aspects, when making their choices of teachers, are particularly those children who have had actual experience with Negro teachers in their own classrooms, and thus have had the opportunity to build up strong positive feelings about them. Experience undoubtedly helps to break down prejudice—the daily experience of living and working in the same classroom, and becoming involved in the close and meaningful relationships of teacher to child, child to teacher. That the majority of the children in this study did have good, friendly feelings about their own teachers, Negro or white, is very evident.

Here are weapons for educators to use in the fight against prejudice, against "primacy" of any color over another.

AN EXPLORATORY INVESTIGATION OF THE EFFECT OF CERTAIN SELECTED FACTORS UPON PERFORMANCE OF SIXTH-GRADE CHILDREN IN ARITHMETIC*

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The purpose of this study was to explore the possible effects of selected variables in controlled elementary school situations.

The specific factors selected for investigation included: (1) the effect of giving some children the correct answers to arithmetic exercises after each exercise was completed, as opposed to withholding this information from other children, (2) the effect of telling some children that other sixth grades were taking the same tests, contrasted with the effect of withholding this information from other children, (3) the children's ability to make self-estimates of their performance before and after working on each arithmetic exercise, and also after each item on the exercise, and finally, (4) children's feelings or attitudes as expressed in interviews and responses to questionnaires.

Previous Research

Various investigations have been made concerning the effects of "knowledge of results," "group competition," "level of aspiration," and "self-estimates of performance."

The literature in three of these areas has been frequently reviewed. Reviews of the literature pertaining to "knowledge of results" include those of Hurlock[2], and Brown[3]. Vaughn and Diserens[4], and May and Doob[5] have reviewed the literature on "competition". Investigations in "level of aspiration" have been reviewed by Frank[6], Rotter[7], and Holt[8]. Pertinent investigations in "self-estimates of performance" were relatively limited. Studies reported by Greene[9], Johnson[10, 11], and Jersild[12] were considered most pertinent to the present investigation.

No investigations were found in which the combinations of all these variables were experimentally studied. In the present investigation an attempt was made to study the possible effects of these factors as integral parts of a complex learning situation.

Method

Data secured from the responses of 216 sixth grade children to specially developed problem and computation exercises in arithmetic were investigated to explore possible effects of selected variables in four administratively controlled situations. Eight central or village schools were carefully selected to participate in the investigation. Criteria used in the selection of schools were as follows: (1) children were not assigned to grades on the basis of ability, (2) each sixth grade was considered a typical sixth grade by the cooperating school personnel, (3) the school

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* Abstract of a Doctoral Dissertation completed in August, 1949, under the direction of Dr. C.W.Hunnicutt, in the Graduate Division of the School of Education, Syracuse University.

2. Elizabeth B. Hurlock. "An Evaluation of Certain Incentives." Journal of Social Psychology, II (August, 1931), pp. 261-290.

3. Francis J. Brown. "Knowledge of Results as an Incentive in Schoolroom Practice," Journal of Educational Psychology, XXIII (October, 1932), pp. 532-552.

4. James Vaughn and Charles W. Diserens. "The Experimental Psychology of Competition." Journal of Experimental Education, VII (September, 1938), pp. 76-97.

5. Mark A. May and Leonard W. Doob. Competition and Cooperation. Bulletin No. 25., Social Science Research Council. 230 Park Avenue, New York (April, 1937). Pp.1 + 91.

6. Jerome D. Frank. "Recent Studies of the Level of Aspiration." Psychological Bulletin, XXXVIII (April, 1941), pp. 218-226.

population of each school was drawn from village and adjacent non-village areas, (4) the schools were in the same approximate geographic area, and (5) children from grades one through twelve, in each school, were housed in the main school plant.

Ten problem exercises and ten computation exercises were specially developed for use in the investigation. The exercises were designed to measure performance in long division, using two-figure divisors. Validity of the items was carefully checked against a ten-step analysis of the long division process, using two-figure divisors. The vocabulary of the problem exercises was carefully checked against the word lists of Dale[13] and Rinsland[14]. Information concerning the adequacy of the exercises for use in the investigation was obtained in a preliminary study. A thirty-minute time limit, for the administration of each exercise, was derived from estimates made by participating teachers, of the average amount of time required by children to complete the exercises. Further evidence concerning the adequacy of the exercises was obtained from performance of control groups in the present investigation.

Reliability of the exercises was found to be relatively high. Product-moment correlation coefficients for the forty-five possible combinations in each series of exercises ranged: (1) for the problem exercises, from .82 to .96, with a median of .89; N ranged from 57 to 69 with a median of 63; (2) for the computation exercises, from .76 to .92, with a median of .84; N ranged from 53 to 69 with a median of 63.

Information was obtained concerning the effect of practice on performance in the control groups. Discrepancies between performance on the initial exercise and subsequent exercises were used as sources of information for the problem and computation exercises respectively.

The hypothesis was made that the discrepancies, for the problem and computation exercises, respectively, were distributed normally in terms of skewness and kurtosis. The hypothesis was tested through the calculation of Beta 1 for skewness and Beta 2 for kurtosis, as demonstrated by Walker[15]. Critical ratios were calculated, as suggested by Smith and Duncan[16], and probability values were secured from tables of normal distribution. Distributions of discrepancy scores were substantially normal for the problem exercises. For the computation exercises, discrepancy scores were generally skewed and also tended to be leptokurtic.

The hypothesis was rejected that discrepancies between performance on the initial exercise and subsequent exercises, for the problem and computation exercises respectively, came from populations of equal variability. The L_1 technique, as modified by Jackson[17], was used to test the hypothesis.

Two of the eight selected schools were randomly assigned to each of four conditions. Each condition was controlled through the use of explicit directions. Information concerning the comparability of the resulting four groups was obtained from performance on: (1) the California Test of Mental Maturity, Elementary S'47 Form, (2) the California Test of Personality, Elementary Form A, (3) the initial problem exercise, and (4) the initial computation exercise.

The hypothesis was made that pupils in the four groups came from populations of equal variability. The hypothesis was tested, using the L_1 technique, as modified by Jackson, for the

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7. Julian B. Rotter. "Level of Aspiration as a Method of Studying Personality, Part I," Psychological Review, XLIX (September, 1942), pp. 463-474.

8. Robert R. Holt. "Effect of Ego-Involvement upon Levels of Aspiration." Psychiatry, VII (1945), pp. 299-317.

9. Edward B. Greene. "Achievement and Confidence on True-False Tests of College Students." Journal of Abnormal and Social Psychology, XXIII (January, 1929), pp. 467-468.

10. Donald M. Johnson. "Confidence and Achievement in Eight Branches of Knowledge." Journal of Educational Psychology, XXXII (January, 1941), pp. 23-36.

11. Donald M. Johnson. "Confidence and Speed in the Two Category Judgment." Archives of Psychology, New York (1939), No. 241, Pp. 52.

12. Arthur T. Jersild. "The Determinants of Confidence." American Journal of Psychology, XLI (October, 1929), pp. 640-642.

13. Edgar Dale. A Suggested Vocabulary for Elementary School Children. Columbus, Ohio: Ohio State University, 1944. Pp. 8 (mimeographed).

14. Henry D. Rinsland. A Basic Vocabulary of Elementary School Children. New York: The Macmillan Co., 1945. Pp. 636.

intelligence quotient data, and the data from performance on the initial problem and computation exercise, respectively. The hypothesis was not rejected for these data. Results are shown in Table I.

The hypothesis was made that the four groups came from populations homogeneous in performance on the mental test and on the initial problem and computation exercise respectively. The hypothesis was tested through the application of analysis of variance. The hypothesis was not rejected for the intelligence quotient data but was rejected for performance on the initial problem and computation exercise. Results are shown in Table II.

The hypothesis was made that the four groups came from homogeneous populations in personality scores, as measured. Pupils in each of the four groups were placed in two categories on the basis of total adjustment percentiles obtained from performance on the California Test of Personality: (1) those with percentile scores of five to fifty; and (2) those with percentile scores of fifty-five to one hundred. The hypothesis was tested through the application of Chi Square as suggested by Snedecor[18]. The Chi Square value obtained for three degrees of freedom was 1.1405, with a probability value of .80-.70. The hypothesis was not rejected that the groups came from populations homogeneous in total adjustment percentiles as measured.

Evidence was required concerning the normality of distributions of performance for the four groups on the arithmetic exercises. Data representing performance of the four groups on the initial problem and computation exercises, respectively, were used. Beta 1 and Beta 2 were calculated, as suggested by Walker[19]. Critical ratios were calculated as suggested by Smith and Duncan[20], and probability values secured from tables of normal distribution. The hypothesis was not rejected that distribution of performance scores for the four groups on the initial problem exercise were substantially normal in terms of the measures of skewness and kurtosis obtained. On the initial computation exercise, distributions of performance for each of the four groups were negatively skewed and leptokurtic in terms of the measures obtained.

The four administratively controlled conditions involved in the investigation were as follows: (1) a control situation (Group I); (2) a condition in which participating children were told that other sixth grades were taking the same tests (Group II); (3) a condition in which participating children were given the correct answers to the arithmetic exercises immediately after answer sheets were turned in; children were given an opportunity to check these answers against work sheets which they retained (Group III); (4) a condition in which children were given information concerning participation by other sixth grades and also the correct answers to the arithmetic exercises (Group IV).

These conditions obtained for a ten day period. During this time, the ten specially developed problem exercises were administered. One exercise was administered daily, using a thirty-minute time limit.

After a non-experimental period of ten days, group conditions were changed. Groups formerly given knowledge of correct answers were no longer given this information (Groups III and IV). Groups which had previously received no knowledge of correct answers were now given this information (Groups I and II). Performance was measured, during a ten day period, through administration of the ten computation exercises. One exercise was administered daily, using a thirty-minute time limit.

Information concerning the possible effects of the four administratively controlled conditions was sought through an investigation of initial and final performance of the groups on the problem and computation exercises.

Analysis of covariance was used to adjust final performance in terms of initial differences between groups. Analysis of variance of the adjusted final performance achieved by children in the four groups was made for both the problem

15. Helen M. Walker. Elementary Statistical Methods. New York: Henry Holt and Co., 1943. Pp.158-163.

16. James G. Smith and Acheson J. Duncan. Sampling Statistics and Applications. New York: McGraw-Hill Book Co., Inc., 1945. P.242.

17. R.W.B.Jackson. Application of the Analysis of Variance and Covariance Method to Educational Problems. Bulletin No. 11, Department of Educational Research.Toronto: University of Toronto, 1940. Pp. 1 + 103.

18. George W. Snedecor. Statistical Methods. Ames,Iowa: Iowa State College Press, 1946. Pp. 205-206.

19. Walker, op. cit.

20. Smith and Duncan, op. cit.

TABLE I

COMPARABILITY OF FOUR EXPERIMENTAL GROUPS
VARIABILITY WITHIN GROUPS

Measure	Deg. of Free.	Contained L_1 Value	L_1 Value Required 5% Level
California Mental Maturity IQ	53/4	.994	.960
Initial Computation Exercise	53/4	.960	.960
Initial Problem Exercise	53/4	.990	.960

TABLE II

COMPARABILITY OF FOUR EXPERIMENTAL GROUPS
HOMOGENEITY OF PERFORMANCE

Measure	Deg. of Free.	Obtained F
California Mental Maturity IQ	3/212	.51
Initial Computation Exercise	3/212	6.69*
Initial Problem Exercise	3/212	3.91*

*Significant at 1% level

TABLE III

F's OBTAINED FOR ANALYSIS OF VARIANCE OF ADJUSTED PERFORMANCE, ON COMPUTATION AND PROBLEM EXERCISE 10, FOR 216 PUPILS UNDER FOUR ADMINISTRATIVE CONDITIONS

Measure	Deg. of Free.	Obtained F
Adjusted Scores Problem Exercise 10	3/211	3.55*
Adjusted Scores Computation Exercise 10	3/211	3.61*

*Significant between 5% and 1% levels

and computation exercises. The technique suggested by Lindquist[21] was used. Results are shown in Table III.

The six possible comparisons between groups for the problem and computation exercises, respectively, were made by calculating the standard error of the differences between adjusted means. The technique suggested by Lindquist[22] was used. Results are shown in Tables IV and V.

Additional information was sought in the investigation. It was considered important to secure information concerning the reaction of children in the four groups to questionnaire items designed to elicit information concerning classroom situations. It was considered important to secure information concerning the ability of children in the four groups to make self-estimates of their performance. It was also considered essential to gain some insight into the meaning which individual children attached to the various requests and responses involved in the investigation.

A specially designed questionnaire was administered before children responded to the first problem exercise, and again, after the final computation exercise was completed. Information was sought, through the application of Chi Square, concerning possible differences between groups in responses to selected items. The technique suggested by Snedecor[23], was used. Differences in responses made by the same group on the two questionnaires were examined by calculating the standard error of the difference between proportions. Tables of Edgerton and Patterson[24] were used. Probabilities obtained were conservative estimates, since the correlation factor was not considered.

Self-estimates of performance by children were secured in response to three requests. Each child was requested to predict his performance on each arithmetic exercise before he attempted to work on the exercise. Each child was requested to tell whether he thought each of his answers on the arithmetic exercises was "right", "wrong", or whether he did not know, "?". Each child was also requested to estimate his performance on each exercise after he had completed the exercise.

Information was secured concerning the variability of performance within groups for the prediction and final estimate data. Trends in the data were also noted.

Information concerning differences between groups in proportions of "right" and "wrong" responses on item-by-item estimates was obtained by claculating the standard error of the difference between proportions. Information concerning possible differences between initial and final responses for the same group were calculated in the same manner. Percent accuracy of "right" and "wrong" responses for each group were also calculated.

Information concerning the meanings which individual children attached to the various requests and responses involved in the investigation was obtained through two interviews with five randomly selected children from each school. The data from interview situations were compared with the various responses made by these children during the investigation.

Summary of Results

1. Superior performance on the arithmetic problem exercises was achieved by children in the group given both knowledge of correct answers and information that other sixth grades were taking the same tests. Superior performance was not achieved by children in the control group or the groups given solely knowledge of correct answers or knowledge that other sixth grades were taking the same tests.

2. Superior performance on the arithmetic computation exercises was generally achieved by children in the experimental groups over the performance of children in the control group. No differences in performance were found between groups given either knowledge of correct answers, or knowledge that other sixth grades were taking the same tests, or both types of information combined.

3. Mean predictions and final estimates were generally similar values and were relatively near the actual mean performance scores for the groups. Children in two of the groups showed a general tendency to have positive discrepancies

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21. E.F.Lindquist. Statistical Analysis in Educational Research. New York: Houghton-Mifflin Co., 1940. P. 191-196.

22. Lindquist, op. cit., p. 178. (A minor modification was made in the formula. Instead of $2/n$, $1/n_1 + 1/n_2$ was used to account for slight differences in numbers in the four groups.)

23. Snedecor, op. cit.

24. Harold A. Edgerton and Donald G. Paterson. "Tables of Standard Errors and Probable Percentages for Varying Numbers of Cases," Journal of Applied Psychology, X (September, 1926), pp. 378-391.

TABLE IV

ADJUSTED MEANS, DIFFERENCES BETWEEN MEANS, STANDARD ERRORS OF THE DIFFERENCES BETWEEN MEANS, CRITICAL RATIOS AND PROBABILITIES IN COMPARISONS OF FOUR ADMINISTRATIVE CONDITIONS

Problem Exercise 10

Group	Condition	Adjusted Means	Diff. Between Means	S. E. diff.	C. R.	P
I	—	14.0458	M_1M_2 = .3377	.7199	.469	.6384
II	KG	14.3835	M_1M_3 = .1234	.7180	.172	.8650
III	KR	13.9224	M_1M = 1.9384	.7151	2.711	.0068
IV	KR KG	15.9842	M_2M_3 = .4611	.7370	.626	.5352
...	...	.....	M_2M = 1.6007	.7323	2.186	.0286
...	...	.....	M_3M = 2.0618	.7131	2.891	.0038

TABLE V

ADJUSTED MEANS, DIFFERENCES BETWEEN MEANS, STANDARD ERRORS OF THE DIFFERENCES BETWEEN MEANS, CRITICAL RATIOS AND PROBABILITIES IN COMPARISONS OF FOUR ADMINISTRATIVE CONDITIONS

Computation Exercise 10

Group	Condition	Adjusted Means	Diff. Between Means	S. E. diff.	C. R.	P
I	KR	25.019	M_1M_2 = .230	.7162	.321	.7490
II	KR KG	24.789	M_1M_3 = 1.842	.6993	2.634	.0086
III	—	23.177	M_1M = .221	.7245	.305	.7566
IV	KG	25.240	M_2M_3 = 1.612	.7144	2.256	.0238
...	...	.....	M_2M = .451	.7300	.618	.5352
...	...	.....	M_3M = 2.063	.7060	2.922	.0036

— No experimental condition
KR Knowledge of results
KG Knowledge of other groups

between predictions and final estimates and performance. A tendency towards negative discrepancies was noted for the other two groups.

4. Children, in three of the four groups receiving knowledge of correct answers throughout the investigation, showed some tendency to have lower discrepancies between estimates and performance than children in the remaining groups.

5. There was some indication that differences existed between the four groups in tendency to place item-by-item estimates of performance in four categories:

"R", "R"	"W", "W"
R W	R W

6. There was a general tendency for higher percent accuracy of "right" than "wrong" item-by-item estimates of performance when "don't know" responses and failure to respond were not considered.

7. Groups, as measured by questionnaire responses, differed significantly in the practice of guessing marks for arithmetic work turned in. There were significant differences between groups in wanting to compare marks with those of other boys and girls. There were also significant differences between groups as to the effort the children thought they would make if they knew that other sixth grades were taking the same tests.

8. As measured by the questionnaires, attitudes within groups changed during the investigation. Significantly fewer children in Group I, at the close of the investigation, wanted to know how many answers were right. Significantly more pupils in Group I wanted to know how their marks compared with the marks of other boys and girls.

9. Results for questionnaire responses were also interpreted as showing possible differences between groups in "liking arithmetic," and in trying for "passing marks".

10. Interview data were interpreted as showing: (1) that paper and pencil responses made during the investigation were reasonably valid, (2) that wide variations existed in the responses made by different individuals, (3) that the same individuals varied in responses made to similar requests upon different occasions.

Discussion

Caution was required in making conclusions. Factors other than the group conditions may have influenced results. As measured in the investigation, differences were found to exist between groups in factors other than intelligence and personality adjustment scores. Final performance on the arithmetic exercises was adjusted to consider initial differences in ability between groups. However, there were significant differences between groups in feelings or attitudes as measured by selected questionnaire items. Similarly, children within some of the groups showed a tendency to change in certain attitudes as measured in a second administration of the questionnaire. There was also some indication of differences between groups in predicting or making self-estimates of performance.

Some limitations were found in the data: (1) it was possible that differences existed between groups in the ability of children to read the problem exercises; (2) the data for the computation exercises were not considered to be normally distributed and thus did not meet a fundamental requirement for the application of analysis of covariance; and (3) distributions of discrepancies of performance between initial and subsequent computation exercises for the control group were found to vary widely in terms of skewness and kurtosis.

Conclusions

When the limitations discussed above were considered, it was possible to make only tentative conclusions regarding the effectiveness of the group conditions.

1. The effectiveness of the experimental conditions, in increasing arithmetic performance in this study, was probably influenced by certain uncontrolled factors operating within the different groups. Some of these factors would appear to be the general classroom atmosphere, and the receptivity of the children to the experimental situation. The experimental conditions produced different effects in the various groups studied.

2. Either experimental condition, knowledge of correct answers, or knowledge that other sixth grades were taking the same tests, or the combination of the two experimental conditions, produced superior performance within some of the groups.

3. In certain groups previously indicated, information concerning correct answers, or knowledge that other sixth grades were taking the same tests, did not produce superior arithmetic performance.

4. There were some indications that the indirect type of group motivation used (knowledge that other sixth grades were taking the same tests) required some time to produce superior arithmetic performance. Throughout the first half of the investigation, children in two of the four groups (Groups II and IV) were merely informed that other sixth grades were taking the same tests. After the problem exercises were completed, these same children were informed that they had done about as well as the other sixth grades taking the tests. Performance of the children in the

experimental groups was not affected until the children, in the appropriate groups, had been given the information comparing previous performance with the performance of the other sixth grades.

Implications

1. It is usually difficult or impossible to randomly assign individual children from public schools to different groups for the purpose of experimentation. Usually, as in the present investigation, the school or the class is the available unit. In certain statistical techniques the random assignment of classes to duplicate experiments in various schools is permitted. However, this design is not always feasible because of administrative restrictions, or the factors to be considered in the investigation. In such cases, however, valuable exploratory information may be attained through use of the classes as the unit for selection, provided that extreme care is utilized in establishing controls and testing the assumptions required for the application of statistical techniques.

2. What appeared to be a simple learning situation apparently involved many factors. Classroom situations may be considered as complex learning situations. Furthermore, the complex situation is undoubtedly constantly changing. In order to bring about the optimum development of the children under her guidance, the teacher must secure as much information as possible concerning each individual child. Some of the techniques used in the investigation may be profitably used by any classroom teacher. Teachers may secure some knowledge of the goals which children establish for themselves; teachers may also gain some knowledge of children's estimates of their work; teachers may gain some insight into children's attitudes, and the meanings which they attach to the various activities going on in the learning situation. Only by securing greater understanding of each individual child can the teacher become most effective in her guidance of children.

CORRELATION OF TWO TESTS OF SPACE PERCEPTION WITH NON-LANGUAGE INTELLIGENCE

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SECTION I

The Problem

World War II served to increase greatly the use of psychological tests. The urgent need for manpower in the overnight expansion and establishment of industrial plants, all geared toward the war effort, created a tremendous problem of personnel selection. By far the majority of tasks to be performed in this gigantic machinery for production were of a routine, repetitive, mechanical, nature. Personnel departments especially of the larger plants resorted to the use of specialized tests of ability, interests, aptitudes, and personality in the selection of personnel to fill the jobs. Today, the Veterans' Administration in its vocational guidance program, nationwide in its scope, administers hundreds of thousands of tests of the nature described above, to veterans who desire to avail themselves of such advisement. The writer has observed, in the capacity of vocational counselor, some relationship between two of the tests of spatial relations and the Non-Language score of an intelligent test. A quantitative determination of that relationship appeared to be indicated.

Statement of the problem. —It was the purpose of this study to measure the correlation of (1) the Survey of Space Relations Ability with the Non-Language factor of the California Test of Mental Maturity; (2) the Survey of Space Relations Ability with the Survey of Object Visualization; and (3) the Survey of Object Visualization with the Non-Language score of the California Test of Mental Maturity.

Importance of the study. —In order to explain the importance of the study, a brief description of the content of the three tests is necessary.[1] The Survey of Space Relations test measures, diagrammatically, the ability to judge geometric patterns. The Survey of Object Visualization test also consists of geometric figures but in a three dimensional plane. The Non-Language section of the California Test of Mental Maturity consists of three sub-tests, two involving spatial perception, and one involving recognition of similarities among drawings of diverse objects taken from everyday life.

These tests singly or in combination are frequently administered in many high schools, colleges, large industrial plants, and vocational guidance centers. The tests are combined into a battery in order to measure aptitude in such fields as architecture, engineering, drafting, art, etc. For example, in the screening of applicants for a dental technician course at the University of California, Los Angeles Campus, Guidance Center, all three tests were used.

One of the questions the present study will attempt to answer is whether or not the Space Relations and Object Visualization tests measure the same thing as the Non-Language subtests of the California Test of Mental Maturity. If the correlations are found to be significantly high, much time, effort, and expanse may be saved, for then it would preclude administering two or three of the tests to the same individual. Furthermore, if a high correlation exists, this fact would be helpful in making future tests of this nature, more varied in item content and of more interest to the testee.

SECTION II

The Groups Studied and Tests Used

Veterans Administration Guidance Centers were decentralized throughout the United States in order to make them more accessible to veterans. Here was an opportunity to obtain cross sectional samplings of the veteran population. However, a number of Guidance Centers realized early in the program that they were dealing with a restricted population and were not obtaining

1. The three tests in the present study may be found in the Appendix of the original study.

cross sectional sampling as they had anticipated. The veterans centers operated by Universities generally scored populations whose abilities were above average norms. [2]

The group studied. —The subjects in the present study were both male and female veterans who appeared for vocational counseling at the University of California, Los Angeles Campus, Veterans Guidance Center. All veterans honorably discharged from the Service with a minimum of three months service were entitled to participate in this program. The number of cases for each of the groups in the present study was as follows:

(A) Survey of Space Relations and California Test of Mental Maturity (Non-Language factor), 382.

(B) Survey of Space Relations and Survey of Object Visualization, 160.

(C) Survey of Object Visualization and California Test of Mental Maturity (Non-Language), 147.

Age range for all tests, 18-50 years with greater concentration of ages on the 25 to 30 year group. Table I shows a ready reference to groups studied. The subjects tested did not include veterans with a rated neuropsychiatric disability, that is, veterans receiving a pension from the Veterans Administration for such a disability. Educational status of the subjects ranged from eighth to sixteenth grade with the average falling around the twelfth grade. One-third of the veterans taking test combination (A) above, and one-half taking combination (B) and (C) were applicants for a dental technician course offered at the University of California, Los Angeles, Extension.

A veteran appearing for vocational advisement was interviewed by a counselor, and then assigned a battery of tests, which usually included a test of intelligence, personality, and interest. Additional tests of spatial relations and object visualization, among others, were given to counselees, who expressed interest in the arts, engineering, drafting, skilled machinist and mechanical fields. The data from the tests were transcribed to a coded file and used in the present study.

Tests Used

California Test of Mental Maturity. —The test was published by the California Test Bureau in 1943. [3] Time limits were recommended with ample time for testees to reach practical limits of their abilities. Test requires sixty minutes to administer. Standardization was based on 25,000 cases. Concerning validity, the Manual of Directions says:

> The authors of the test believe that the multiple factor of intelligence comes nearer to explaining observable phenonena than does the strong central factor theory alone, and that progress in determining the nature of mentality and the value of tests of mental maturity is dependent largely upon further studies in factor analysis. [4]

A correlation of .88 was obtained with the Stanford-Binet. [5] A reliability of .90 was found with a group of high school and college students and adults as shown in Table II. The test is divided into three subtests, constituting the Non-Language Score, and three additional subtests involving arithmetical reasoning, logic and vocabulary. A study is being made at the University of California Extension Veterans Guidance Center using this test on college and non-college counselees for the purpose of establishing additional norms.

Survey of Space Relations Ability. —The test was published by the California Test Bureau in 1942. [6] The ability to perceive the relationships among objects in space is one of the most important factors in a wide variety of mechanical jobs as well as mechanical and artistic professions. [7] Fifteen minutes is the time it takes to administer this test. Standardization based on one thousand adults of both sexes from 18 to 50 years,

2. An unpublished study of veterans' scores on the California Test of Mental Maturity, conducted at the University of California, Los Angeles, Veterans Guidance Center, 1948.

3. Elizabeth T. Sullivan, Willis W. Clark, and Ernest W. Tiegs. California Test of Mental Maturity, (Hollywood, California: California Test Bureau, 1947).

4. Ibid., Manual of Directions.

5. Ibid., Manual of Directions.

6. Harry W. Case, and Floyd Ruch. Survey of Space Relations Ability (Hollywood, California: California Test Bureau, 1942).

7. Ibid., Manual of Directions.

TABLE I

TABULAR DESCRIPTION OF THE GROUPS STUDIED

Tests	N	Average Age	Age Range	Dental Tech. App.	Ave. Ed. Level	Range of Ed. Level
SSR* N-L CTMM**	382	28	18-50	130	12 gr.	8-16 gr.
SSR SOV***	160	28	18-50	82	12 gr.	8-16 gr.
SOV N-L CTMM	147	28	18-50	75	12 gr.	8-16 gr.

* Survey of Space Relations
** Non-Language, California Test of Mental Maturity
***Survey of Object Visualization

TABLE II

CALIFORNIA TEST OF MENTAL MATURITY RELIABILITY SCORES BASED ON THREE GROUPS OF HIGH SCHOOL, COLLEGE STUDENTS AND ADULTS*

	N-400 Gr. 9-12	N-250 College	N-250 Adults
Total Mental Factors	.940	.943	.948
Language Factors	.936	.915	.927
Non-Language Factors	.827	.880	.891

*Taken from Manual of California Test of Mental Maturity published by California Test Bureau, 1943.

TABLE III

SUMMARY OF STATISTICAL FINDINGS

	N	M	P. E.	S. D.	REG EQU	Std. Err of Est	Range of Talent	r
Survey of Space Relations		60.7		21.62	.11B+26.7	19.5		
and Non-Language	382	33.4	.03	5.31	1.7A + 3.9	4.8	.40	.43
Survey of Space Relations		62.75		20.22	1.15C+36.7	17.18		
and Object Visualization	160	23.05	.04	9.45	.25B+ 7.37	8.1		.53
Survey of Object Visualiza-		24.16		8.82	.62A+ 3.2	8.3		
tion and Non-Language	147	33.70	.05	4.81	.19C+29.1	4.52	.51	.34

selected to represent a true cross section of adult population available to industry. Each form consists of thirty-two designs which can be completed by assembling the proper parts. Validity coefficients ranged from .34 to .62 with instructors rating for students in electric, radio, auto and woodshop courses. The highest correlation was obtained for the groups in radio electric shop. A reliability coefficient of .93 was computed for the above groups.[8] The test items are represented in two dimensions, and the designs are in white against a blue background in order to represent as near an actual blueprint as possible.

Survey of Object Visualization. —The California Test Bureau published this test in 1945.[9] The testee is required to predict how an object will look when its shape and position are changed. Norms were based on two hundred fifty male and female cases selected from various occupations. Test items are represented in three dimensions. Reliability of .91 was obtained by split half method. Validity coefficients were obtained by the author on three groups in a study at the Hughes Aircraft Plant.[10]

(A) Fifty-five lathe operator trainees with grades .42.

(B) Two groups of aircraft design engineers with merit rating .45 and .52.

The test is subject to an extended study at the Los Angeles City College, where test scores are being correlated with a variety of factors including group studies. The American Dental Association is using this test experimentally as one of their estimates in the comprehensive study of techniques in selecting dental applicants. No results are available to date.

SECTION III

Results of the Study.

Though the present study revealed low correlations, interpretation of the results may be of significance to vocational counselors.

The Survey of Space Relations with the Non-Language Factor of the California Test of Mental Maturity. —A correlation of .43 was found with a P.E. of .03. The mean for the Space Relations Test was 60.7, and for the Non-Language Test, 33.4. The SD found was 21.62 and 5.31, respectively. Regression equation was applied to both tests in order to predict a score in one when the other test is known. Substituting A for the Non-Language and B for the Space Relations:

A = .11B + 26.7 STD Error of Est 19.5
B = 1.7A + 3.9 STD Error of Est 4.8

The formula given by Garrett[11] for estimating a correlation in a wide range from a knowledge of the correlation in a restricted range was applied in this case. The mean for the Non-Language, 33.4, is translated to an IQ of 106, suggesting a restricted range. The SD used in the formula, (in raw score points) was 5.25 and was obtained from an unpublished study at the University of California at Los Angeles Veterans Guidance Center.[12] The corrected correlation of .40 was smaller since the SD computed in the writer's study was larger than the one substituted for in the correction for range of talents. A summary of the statistical findings appear in Table III for ready reference.

The Survey of Space Relations and Survey of Object Visualization. —A closer correspondence was revealed between the two space tests as noted by the correlation of .53 with a P.E. of .04. The mean for the Space Relations was 62.75 and 23.05 for the Object Visualization. The SDs were 20.22 and 9.45, respectively. Application of the regression equation and computation of the standard error of estimate gave the following formulae for prediction. Substituting (B) for Space Relations and (C) for Object Visualization:

B = .1.15C + 26.7 STD Error of Est 17.18
C = .25B + 7.37 STD Error of Est 8.1

Survey of Object Visualization with the Non-Language score of the California Test of Mental Maturity. —Depth perception ability appeared to correlate lowest with non-language intelligence as revealed by a correlation of .34 and P.E. of

8. Ibid., Manual of Directions.

9. D. R. Miller. Survey of Object Visualization (Hollywood, California: California Test Bureau, 1945).

10. D. R. Miller. An unpublished study conducted at the Hughes Aircraft Corp., 1945.

11. H. E. Garrett. Statistics in Psychology and Education (New York: Longmans, Green and Co., 1941), p. 67.

12. Ibid., Ch. III.

.05. The mean for the Object Visualization was 24.16, and for the Non-Language, 33.70. Applying Garrett's formula again for range of talent (in view of the non-language mean) the correlation was increased to .51. Regression equations and standard error of estimate computed gave the following prediction formulae—(A) substituted for Non-Language and (C) for Object Visualization:

A = .19C + 29.1	STD Error of Est 4.52
C = .62A + 3.2	STD Error of Est 8.3

The correlations obtained do not in general justify the primary purpose of the study, namely, substitution. However, a number of possibly significant considerations arising from the study are presented in the next section.

SECTION IV

Summary and Conclusions

Summary. —The purpose of this study was to determine the relationship between two tests of space perception with each other, and also with a non-language intelligence test. The results show that:

1. The relationship between the two space tests are not sufficiently high to justify substitution of one test for the other.

2. Correlations between the space perception tests and non-language intelligence are low for purposes of substitution.

3. The standard error estimate used with the regression equations computed for all tests in the study was found to be too high to make test score predictions valid.

Conclusions. —Although the correlations have been shown to lack statistical significance for purposes of this study, a number of implications arising from the study are presented.

1. If the correlation between the non-language and the space relations tests were high, then one could conclude that the three subtests of the California Test of Mental Maturity, giving a non-language score, all test the same thing. This would have been contrary to the intentions of the authors of the test. The low correlation then supports the authors' contentions that the three subtests measure separate factors, and that each of these is individually computable.

2. The correlation between the Space Relations and the Object Visualization tests was shown to be somewhat higher, indicating some likeness in ability for two and three dimension space judgment. The fact that the correlation was not higher may be shown to support the contention that ability for two dimensional perception is not identical with ability for three dimensional (depth) perception. For example, an artist, dental technician, or draftsman would need to possess depth perception (as tested on the Object Visualization test). An auto mechanic or assembler of routine variety (auto parts, furniture, etc.,) may do well with only two dimensional space perception ability as tested on the Survey of Space Relations.

3. The correlations borne out in the study justify the administering of all three tests to the dental technician applicants (described in Section III) insofar as each test measures something different. Further, the two space tests correlations may suggest to vocational counselors a more judicious use of these two tests and not to regard them as both measuring the same thing.

4. Although not sufficiently high to warrant substitution, the correlations between space perception and non-language intelligence reveal a fairly positive correspondence and suggest that non-language intelligence includes space relations ability as a significant item. This finding appears to be in line with Thurstone's studies on Primary Mental Abilities, where he showed space perception ability to be an important consideration in measuring non-language intelligence.

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